HYDAD INTERNATIONAL

Explosive Atmosphere Sensors

SENSORS FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

Sensors for Potentially Explosive Locations:

HDA 4700 ATEX, CSA, IECEx Flameproof enclosure
EDS 4400 ATEX, CSA, IECEx Flameproof enclosure, programmable
ETS 4500 ATEX, CSA, IECEx Flameproof enclosure
HDA 4700 ATEX Intrinsically safe
HDA 4400 ATEX Intrinsically safe
HDA 4300 ATEX Intrinsically safe
HDA 4100 ATEX Intrinsically safe
EDS 4400 ATEX Intrinsically safe, programmable
EDS 4300 ATEX Intrinsically safe, programmable
EDS 4100 ATEX Intrinsically safe, programmable
HDA 4700 CSA Intrinsically Safe
HDA 4400 CSA Intrinsically Safe
HDA 4300 CSA Intrinsically Safe
HDA 4100 CSA Intrinsically Safe
HDA 4700 IECEx Intrinsically safe
HDA 4400 IECEx Intrinsically safe
HDA 4300 IECEx Intrinsically safe
HDA 4100 IECEx Intrinsically safe
HDA 4700 Flush membrane ATEX Intrinsically safe
HDA 4400 Flush membrane ATEX Intrinsically safe
HDA 4300 Flush membrane ATEX Intrinsically safe
HDA 4700 Flush membrane IECEx Intrinsically safe
HDA 4400 Flush membrane IECEx Intrinsically safe
HDA 4300 Flush membrane IECEx Intrinsically safe
HDA 4700 Flush membrane ATEX, CSA, IECEx flameproof enclosure
HFS 2100 ATEX Intrinsically safe
HFS 2500 ATEX Intrinsically safe
HFT 3100 ATEX CSA IECEx flameproof enclosure
HFT 3100 ATEX IECEx Intrinsically Safe

For several years HYDAC ELECTRONIC has been systematically stepping up the expansion of its range of sensors for potentially explosive locations. The sensors for potentially explosive locations can be supplied with a variety of output signals, connectors and fluid port connection options. This versatility, combined with certification to ATEX, CSA and IECEx, ensures worldwide acceptance of our products.

Further sensors for potentially explosive locations can be found in the section	"OEM
Products for Large Volume Production".	

Sensors for notentially	HDA 4700	HDA 4300	HDA 4100	EDS 4400	EDS 4300	EDS 4100	ETS 4500	НFT 3000	HFS 2500	HFS 2100
Sensors for potentially explosive atmospheres	ST.	ST.	S.	A	A.	3	8 M	6	- Contraction of the second se	
Measured variable	Pres- sure	Pres- sure	Pres- sure	Pres- sure	Pres- sure	Pres- sure	Temp.	Flow	Flow	Flow
Accuracy (max. error)	0.5	1.0	1.0	1.0	1.0	1.0	2.0	2.0	5, 10	10
Number of switching outputs				1 or 2	1	1			1 or 2	1 or 2
Analog output	✓	✓	✓				✓			
Available as individual units	✓	✓	✓	✓	✓	✓	✓	\checkmark	\checkmark	\checkmark
OEM product for Irg. vol. prod.				√	√	✓				
Flush membrane	✓	✓								
HART	✓						 Image: A start of the start of	\checkmark		
ATEX Intrinsically safe	✓	✓	✓	✓	✓	√		\checkmark	✓	\checkmark
Flush membrane ATEX Intrinsi- cally safe	✓	✓								
CSA Intrinsically safe	✓	✓	✓							
IECEx Intrinsically safe	✓	✓	✓					\checkmark		
Flush membrane IECEx Intrin- sically safe	✓	✓								
ATEX / IECEx flameproof, CSA explosion proof (all in one)	✓						✓	\checkmark		
Flush membrane ATEX / IECEx flameproof, CSA explosion proof (all in one)	✓									

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Note: Not all feature combinations are possible. For precise information, please consult the relevant data sheet.

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Description:

The HDA 4700 electronic pressure transmitter series with flameproof enclosure has triple approval according to ATEX, CSA and IECEx which ensures the instrument is universally suitable for use in potentially explosive environments around the world.

Each instrument is certified by the three approvals organizations and is labelled accordingly. Therefore there is no longer any need to stock multiple devices with separate individual approvals. As with the industrial version of the HDA 4700, those with triple approval have a proven, fully-welded stainless steel measurement cell with thin film strain gauge without internal seals. The main areas of application are in mining and the oil & gas industry, e.g. in underground vehicles, hydraulic power units, blow-out preventers (BOPs), drill drives or valve actuation stations as well as in areas with high levels of dust contamination.

Protection types and applications: cCSAus Explosion Proof - Seal Not Required

Class I Group A, B, C, D, T6, T5 Class II Group E, F, G Class III Type 4

ATEX Flame Proof I M2 Ex d I Mb II 2G Ex d IIC T6, T5 Gb II 2D Ex tb IIIC T110 .. 130 °C Db

IECEx Flame Proof Ex d I Mb Ex d IIC T6, T5 Gb Ex tb IIIC T110 .. 130 °C Db

Special features:

- Accuracy ≤ ± 0.25 % FS B.F.S.L • Certificates:
- ATEX KEMA 10ATEX0100 X CSA MC 224264 IECEx KEM 10.0053X
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4700 ATEX, CSA, IECEX Flameproof Enclosure



lechnical data:	
Input data	
Measuring ranges	100, 300, 500, 1000, 1500, 3000, 5000, 6000, 9000, 10000, 15000, 20000, 30000 psi
Overload pressures	290, 1160, 1160, 2900, 2900, 7250, 11600, 11600, 14500, 14500, 23200, 38400, 43500 psi
Burst pressures	1450, 2900, 2900, 7250, 7250, 14500, 29000, 29000, 29000, 29000, 43500, 43500, 58000 psi
Mechanical connection ¹⁾	1/4-18 NPT, male
(torque value)	1/4-18 NPT, female
	SAE 6 9/16-18 UNF 2A
	SF 250 CS20, Autoclave(7/16-20-UNF 2B) F 250 C, Autoclave (9/16-18 UNF 2B)
	30lb-ft(40Nm) - 1/4 NPT, SF 250 CX20 15 lb-ft(20Nm) - SAE 6, F 250 C
Parts in contact with medium	Stainless steel: 1.4542; 1.4571; 1.4435; 1.4404; 1.4301 Seal: FPM
Conduit and housing material	1.4404; 1.4435 (316L)
Output data	
Output signal, permitted load resistance ²⁾	4 20 mA, 2 conductor $R_{Imax} = (U_B - 8 V) / 20 mA [k\Omega]$
Accuracy to DIN 16086.	≤ ± 0.25 % FS tvp.
Max. setting	≤ ± 0.5 % FS max.
Accuracy at min. setting	≤ ± 0.0045% FS/°F typ.
(B.F.S.L.)	≤ ± 0.0085% FS/°F max.
Temperature compensation Zero point	≤ ± 0.0045% FS/°F typ. ≤ ± 0.0085% FS/°F max.
Temperature compensation	≤ ± 0.008 % FS / °C typ.
Over range	≤ ± 0.015 % FS / °C max.
Non-linearity at max. setting to DIN 16086	≤ ± 0.3 % FS max.
Hysteresis	≤ ± 0.1 % FS max.
Repeatability	≤ ± 0.05 % FS
Rise time	≤ 1.5 ms
Long-term drift	≤ ± 0.1 % FS typ. / year
Environmental conditions	
Compensated temperature range	T5, T130 °C: -13+176°F T6, T110 °C: -13+140°F
Operating temperature range ³⁾	T5, T130 °C: -40+176°F / -4+176°F T6, T110 °C: -40+140°F / -4+140°F
Storage temperature range	-40+212°F
Fluid temperature range ³⁾	T5, T130 °C: -40+176°F / -4+176°F T6, T110 °C: -40+140°F / -4+140°F
	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0 / 1 / 31
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g
Protection class to IEC 60529 to ISO 20653	IP 65 (Vented Gauge) IP 69K (Sealed Gauge)
Other data	
Voltage supply	830 V DC
Residual ripple of supply voltage	<u>≤5%</u>
Life expectancy	> 10 million cycles 0 100 % FS
Weight	~ 300 g
Note: Reverse polarity protection of	the supply voltage, excess voltage, override and short circuit

protection are provided. **BS (Full Scale)** = relative to the full measuring range **B.F.S.L.** = Best Fit Straight Line ¹⁾ Other mechanical connections on request

- ²⁾ Other output signals on request
- ³⁾ -4°F with FPM seal, -40°F on request

Pin connections:

Conduit (single cores)

Core	HDA 47XG-A
white	Signal +
brown	Signal -
green	n.c.
vellow	n.c.

Areas of application:

Approvals	cCSAus: Explosion Proof - Seal not required			
	ATEX: Flame Proof			
	IECEx: Flame Proof			
Certificate	ATEX KEMA 10ATEX100X			
	CSA MC 224264			
	IECEx KEM 10.0053X			
Applications /	c CSA us:			
Protection types	Class I Group A, B, C, D, T6; T5			
21	Class II Group E. F. G			
	Class III			
	Турсч			
	ATEX [.]			
	I M2 Exd I Mb			
	II 2D Ex to IIIC T110 130 °C Db			
	IECEx:			
	Ex d I Mb			
	Ex d IIC T6, T5 Gb			
	Fx th IIIC T110 130 °C Db			

Model code:
HDA 4 7 X X – A – <u>XXXXX</u> – D X – <u>000</u> (PSI) 72in
Mechanical connection7= SAE 6, 9/16-18 UNF 2A male8= 1/4-18 NPT, maleF= 1/4-18 NPT, femaleC= SF 250 CX20, Autoclave (7/16-20 UNF2B)B= F 250 C, Autoclave (9/16-18 UNF 2B, female)Others on requestElectrical connection9= 1/2-14 NPT Conduit (male thread), single coresG= 1/2-14 NPT Conduit (male thread), fiving leade
Signal
A = 4 20 mA, 2 conductor Pressure ranges in psi 0100, 0300, 0500, 1500, 3000, 5000, 6000, 9000 10000, 15000 (only with mechanical connection "C") 20000, 20000 (only with mechanical connection "C")
Approval D = CSA Explosion Proof - Seal not required ATEX Flame Proof IECEx Flame Proof
Type of measurement cellS= Sealed Gauge (sealed to atmosphere)≥ 500 psiV= Vented Gauge (vented to atmosphere)≤ 300 psi
Modification number
Cable length in inches Standard = 72 inches

Accessories:

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.













Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS

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INTERNATIONAL



Description:

The programmable electronic pressure switch EDS 4400 with flameproof enclosure has triple approval according to ATEX, CSA and IECEx which ensures the instrument is universally suitable for use in potentially explosive environments around the world.

Each instrument is certified by the three approval organizations and is labelled accordingly. Therefore there is no longer any need to stock multiple devices with separate individual approvals.

As with the industrial version of the EDS 4400, those with triple approval have a proven, fully-welded stainless steel measurement cell with thin film strain gauge without internal seals.

The instrument is programmed conveniently and simply using the HPG 3000 HYDAC programming unit.

The main areas of application are in mining and the oil & gas industry, e.g. in underground vehicles, hydraulic power units, blow-out preventers (BOPs), drill drives or valve actuation stations as well as in areas with high dust loads.

Protection types and applications:

cCSAus Explosion Proof - Seal Not Required Class I Group A, B, C, D, T6, T5 Class II Group E, F, G Class III Type 4 ATEX Flame Proof I M2 Ex d I Mb II 2G Ex d IIC T6, T5 Gb

II 2D Ex tb IIIC T110 .. 130 °C Db IECEx Flame Proof

Ex d I Mb Ex d IIC T6, T5 Gb Ex tb IIIC T110 .. 130 °C Db

Special features:

- Accuracy $\leq \pm 0.5\%$ FS B.F.S.L.
- Certificates: ATEX KEMA 10ATEX100 X CSA MC 224264 IECEx KEM 10.0053X
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Switch EDS 4400 Programmable ATEX, CSA, IĔČEx Flameproof Enclosure



chnical data

Technical uata.	
Input data	
Measuring ranges	100, 300, 500, 1000, 1500, 3000, 5000, 6000, 9000, 10000, 15000, 20000, 30000 psi
Overload pressures	290, 1160, 1160, 2900, 2900, 7250, 11600, 11600, 14500, 14500, 23200, 38400, 43500 psi
Burst pressure	1450, 2900, 2900, 7250, 7250, 14500, 29000, 29000, 29000, 29000, 43500, 43500, 58000 psi
Mechanical connection ¹⁾ (torque value)	1/4-18 NPT, male 1/4-18 NPT, female SAE 6 9/16-18 UNF 2A
	SF 250 CX20, Autoclave(7/16-20-UNF 2B) SAE 6: 15lb-ft(20Nm)
Parts in contact with medium	SF 250 CX20, 1/4 NPT: 30lb-ft(40Nm) Stainless steel: 1 4542: 1 4571: 1 4435:
	1.4404; 1.4301 Seal: FPM
Conduit and housing material	1 4404: 1 4435 (316L)
Output data	
Accuracy to DIN 16086	≤ ± 0.5 % FS tvp.
Max. setting	$\leq \pm 1.0 \%$ FS max.
Repeatability	≤ ± 0.1 % FS max.
Temperature drift	≤ ± 0.017% FS/°F max. zero point
- F	≤ ± 0.017% FS/°F max. range
Switch output ²⁾	1 or 2 PNP transistor switch outputs
Output load	max. 1.2 A on version with 1 switch output max. 1 A each on version with 2 switch outputs
Switch points / hysteresis / N/C or N/O function	user-programmable with HYDAC Programming Unit HPG 3000
Rising switch point and falling switch point delay	8 2000 ms; User-programmable with HYDAC Programming Unit HPG 3000
Long-term drift	≤ ± 0.3 % FS typ. / year
Environmental conditions	
Compensated temperature range	T5, T130 °C: -13+176°F T6, T110 °C: -13+140°F
Operating temperature range ³⁾	T5, T130 °C: -40+176°F / -4+176°F T6, T110 °C: -40+140°F / -4+140°F
Storage temperature range	-40+212°F
Fluid temperature range ³⁾	T5, T130 °C: -40+176°F / -4+176°F T6, T110 °C: -40+140°F / -4+140°F
(EN 61000-6-1 / 2 / 3 / 4 EN 60079-0 / 1 / 31
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g
Protection class to IEC 60529 to ISO 20653	IP 65 (Vented Gauge) IP 69K (Sealed Gauge)
Other data	
Voltage supply	12 30 V DC
Current consumption	~ 25 mA (plus switching current)
Residual ripple of supply voltage	≤ 5 %
Life expectancy	> 10 million cycles 0 100 % FS
Weight	~ 300 g
Note: Reverse polarity protection of	f the supply voltage, excess voltage, override and short circuit

protection are provided.

PS (Full Scale) = relative to complete measuring range
 Other mechanical connection options available on request

²⁾ NPN switching outputs upon request

3) -4 °F with FPM seal, -40 °F on request

Setting ranges for the switch | Areas of application: outputs:

- Switch point or upper switch value 5% .. 100% of the measurement range
- Hysteresis or lower switch value 1% .. 96% of the measurement range _

Pin connections:

Conduit (single cores)



red	+UB	+U _B
white	Switch output 1	Switch output 1
brown		Switch output 2
black	0 V	0 V
areen	SDA ¹⁾	SDA ¹⁾

Conduit (flying leads)



Core	EDS 44xG-*-1P	EDS 44xG-*-2P
white	Switch output 1	Switch output 1
brown	n.c.	Switch output 2
green	SDA ¹⁾	SDA ¹⁾
yellow	0 V	0 V
grey	+UB	+UB
	amina lina	

1) Programming line

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Programming Unit:

(must be ordered separately)

HPG 3000 - 000 Portable Programming Unit Part. No. 909 422

HPG 3000 Power Supply with connector: Part #02091103



The pressure switch can be connected to the HPG 3000 very simply by using the UVM 3000 Connection Adapter (see Accessories Brochure).

CAUTION!

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The HPG 3000 Programming Unit may only be used outside the potentially explosive area.

Approvals Certificate	CCSAus: Explosion Proof - Seal not required ATEX: Flame Proof IECEx: Flame Proof ATEX KEMA 10ATEX100X CSA MC 224264
	IECEx KEM 10.0053X
Applications / Protection types	c CSA us: Class I Group A, B, C, D, T6; T5 Class II Group E, F, G Class III Type 4
	ATEX: I M2 Ex d I Mb II 2G Ex d IIC T6, T5 Gb II 2D Ex tb IIIC T110 130 °C Db
	IECEx: Ex d I Mb Ex d IIC T6, T5 Gb Ex tb IIIC T110 130 °C Db

Model code:
EDS 44XX – <u>XXXX</u> – XP – DX – <u>000</u> (PSI) <u>72in</u>
Mechanical connection 7 = SAE 6, 9/16-18 UNF 2A male
8 = 1/4-18 NPT, male
F = 1/4-18 NPT, female
C = SF 250 CX20, Autoclave (7/16-20 UNF2B) B = F 250 C, Autoclave (9/16-18 UNF 2B, female)
Others on request
Electrical connection 9 = 1/2-14 NPT Conduit (male thread), single cores
G = 1/2-14 NPT Conduit (male thread), flying leads
Pressure ranges in psi
10000, 15000 (only with mechanical connection "C") 20000, 30000 (only with mechanical connection "B")
Number of switch outputs 1 = 1 switch output 2 = 2 switch outputs
Output type P = Programmable
Approval D = CSA Explosion Proof - Seal not required ATEX Flame Proof IECEx Flame Proof
Type of measurement cell S = Sealed Gauge (sealed to atmosphere) ≥ 500 psi V = Vented Gauge (vented to atmosphere) ≤ 300 psi
Modification number 000 = Standard
Cable length in inches

Standard = 72 inches

Accessories:

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.















Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS

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MDAD INTERNATIONAL



Description:

The electronic temperature transmitter series ETS 4500 with flameproof enclosure has triple approval according to ATEX, CSA and IECEx which ensures that the device is universally suitable for use in potentially explosive environments around the world.

Each device is certified by the three approval organizations and is labelled accordingly. Therefore it is no longer necessary to stock multiple devices with separate individual approvals. Based on a silicon semiconductor device and corresponding evaluation electronics, the temperature sensor is designed to measure temperatures in the range -13 to +212 °F.

Its main applications are in mining and the oil and gas industry, e.g. in underground vehicles, hydraulic power units, blow-out preventers (BOPs), drill drives or valve actuation stations as well as in areas with high dust loads.

Protection types and applications:

cCSAus Explosion Proof - Seal Not Required Class I Group A, B, C, D, T6, T5 Class II Group E, F, G Class III Type 4 ATEX Flame Proof I M2 Ex d I Mb II 2G Ex d IIC T6, T5 Gb II 2D Ex tb IIIC T110 .. 130 °C Db IECEx Flame Proof Ex d I Mb Ex d IIC T6. T5 Gb Ex tb IIIC T110 .. 130 °C Db

Special features:

- Accuracy ≤ ± 1.5 % FS B.F.S.L.
- Certificates: ATEX KEMA 10ATEX100 X CSA MC 224264 IECEx KEM 10.0053X
- Robust design
- Pressure resistant to 8700 psi (depending on model)
- Excellent EMC characteristics
- Excellent durability

Electronic **Temperature Transmitter** ETS 4500 ATEX, CSA, IECEx **Flameproof Enclosure**





Technical data:

Input data			
Measuring principle	Silicon semiconductor device		
Measuring range	-13 to 212°F(-25+100°F)		
Probe length inch(mm)	0.42(10.7), 3.94(100), 9.84(250), 13.8(350)		
Pressure resistance	8700 psi (probe length 0.42)		
	1812 psi (probe length 3.94)		
	1812 psi (probe length 9.84)		
	1812 psi (probe length 13.8)		
Mechanical connection	1/4-18 NPT male (30 ft-lb (40 Nm))		
	SAE 6 9/16-UNF 2A (15 ft-lb (20 Nm))		
Parts in contact with medium	Stainless steel: 1.4571; 1.4301 (316Ti; 304 Seal: FPM		
Conduit and housing material	1.4404; 1.4435 (316L)		
Output data			
Output signal ¹⁾	4 20 mA, 2 conductor R _{Lmax} = (U _B - 8 V) / 20 mA [kΩ]		
Accuracy	≤ ± 1.5 % FS typ. ≤ ± 3.0 % FS max.		
Rise time to DIN EN 60751	t ₅₀ :		
Environmental conditions			
Operating temperature range ²⁾	T5, T130 °C: -40+176°F / -4+176° T6, T110 °C: -40+140°F / -4+140°F		
Storage temperature range	-40212°F		
Fluid temperature range ²⁾	T5, T130 °C: -40+176°F/ -4+176°F T6, T110 °C: -40+140°F/ -4+140°F		
((mark	EN 61000-6-1 / 2 / 3 / 4		
	EN 60079-0 / 1 / 31		
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g		
Protection class to ISO 20653	IP 69K		
Other data			
Voltage supply	8 30 V DC		
Residual ripple of supply voltage	≤ 5 %		
Life expectancy	> 10 million cycles 0 100 % FS		
Weight	~ 280 g (probe length 0.42 in)		
	~ 315 g (probe length 3.94 ln)		
	\sim 385 g (probe length 3.84 in)		
Note: Reverse polarity protection of the sup protection are provided.	oply voltage, excess voltage and override short circuit		

FS (Full Scale) = relative to the complete measuring range
 ¹⁾ Other output signals on request
 ²⁾ -4 °F with FPM seal, -40 °F on request

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Pin connections:

Conduit (single cores)



Core	ETS 45X9-A
red	Signal +
black	Signal -
green- yellow	Housing

Conduit (flying leads)



Core	ETS 45XG-A
white	Signal +
brown	Signal -
green	n.c.
yellow	n.c.

Areas of application	n:
Approvals	cCSAus: Explosion Proof - Seal not required ATEX: Flame Proof IECEx: Flame Proof
Certificate	ATEX KEMA 10ATEX100X CSA MC 224264 IECEx KEM 10.0053X
Applications / Protection types	c CSA us: Class I Group A, B, C, D, T6; T5 Class II Group E, F, G Class III Type 4
	ATEX: I M2 Ex d I Mb II 2G Ex d IIC T6, T5 Gb II 2D Ex tb IIIC T110 130 °C Db
	IECEx: Ex d I Mb Ex d IIC T6, T5 Gb Ex tb IIIC T110 130 °C Db

Model code:

ETS 4 5 X X – A – D – <u>XXX</u> – <u>000</u> (<u>72in</u>)
Mechanical connection 7 = SAE 6 9/16 UNF 2A male 8 = 1/4-18 NPT male
Electrical connection 9 = 1/2-14 NPT Conduit (male thread), single cores
G = 1/2-14 NPT Conduit (male thread), flying leads
Signal
A = 4 20 mA, 2 conductor
Approval D = CSA Explosion Proof - Seal not required ATEX Flame Proof IECEx Flame Proof
Probe length 010 = 0.42" (10.7mm) (SAE 6 only) 100 = 3.94" (100mm) (1/4 NPT only) 250 = 9.84" (250mm) (1/4 NPT only) 350 = 13.8" (350mm) (1/4 NPT only)
Modification number 000 = Standard
Cable length in inches

Са Standard = 72 inches

Accessories:

Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.







Note:

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

For European mechanical connection see European Catalog

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

HYDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4700 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4700 in ATEX version has a stainless steel measurement cell with thin-film strain gauge.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust contamination, e.g. in mills.

Protection types and applications: I M1 Ex ia I Ma

II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 3G Ex nA IIC T6,T5,T4 Gc II 3G Ex ic IIC T6,T5,T4 Gc

II 1D Ex ia IIIC T85°C Da II 1D Ex ta IIIC T80/90/100°C Da T_{500} T90/T100/T110°C Da II 2D Ex tb IIIC T80/90/100°C Db II 3D Ex tc IIIC T80/T90/T100°C Dc II 3D Ex ic IIIC T80/T90/T100°C Dc

Special features:

- Accuracy $\leq \pm 0.25$ % FS B.F.S.L.
- Certificates: KEMA 05ATEX1016 X KEMA 05ATEX1021
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4700 ATEX Intrinsically Safe ATEX Dustproof Enclosure ATEX Non-sparking



Technical data:

Input data		
Measuring ranges ¹⁾	150, 500, 750, 1000, 1500, 3 9000, 15000 psi	3000, 5000, 6000,
Overload pressures	290, 1160, 1740, 2900, 2900 11600, 14500, 23200 psi	0, 7250, 11600,
Burst pressures	1450, 2900, 4350, 7250, 72 29000, 29000, 43500 psi	50, 14500, 29000,
Mechanical connection ¹⁾	SAE 6 9/16-18 UNF 2A SF 250 CS20, Autoclave(7/1	16-20-UNF 2B)
Torque value	15lb-ft(20Nm) - SAE 6 30lb-ft(40Nm) SF 250 CX20	
Parts in contact with medium	Stainless steel: 1.4542; 1.4 1.4404; 1.4 Seal: EPM	4571; 1.4435; 4301
Output data		
Output signal permitted load resistance	420 mA, 2 conductor Rimax = (U _B - 12 V)	/ 20 mA [kΩ]
Accuracy to DIN 16086, Max. setting	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.	· · · · · · · · · · · · · · · · · · ·
Accuracy at min. setting (B.F.S.L.)	≤ ± 0.15 % FS typ. ≤ ± 0.3 % FS max.	
Temperature compensation Zero point	0.0045% FS/°F typ. 0.0085% FS/°F max.	
Temperature compensation Over range	0.0045% FS/°F typ. 0.0085% FS/°F max.	
Non-linearity at max. setting to DIN 16086	≤ ± 0.3 % FS max.	
Hysteresis	≤ ± 0.1 % FS max.	
Repeatability	≤ ± 0.05 % FS	
Rise time	≤ 1.5 ms	
Long-term drift	≤ ± 0.1 % FS typ. / year	
Environmental conditions		
Compensated temperature range	-4+185°F	
Operating temperature range ²⁾	-40+140°F/ -4+140°F	
Storage temperature range	-40 to 212°F	
Fluid temperature range ²⁾	-20+140°F	
	40+140°F / -4+140°F	
(€ mark	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0 / 11 / 26 / 31 EN 50303	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g	
Protection class to IEC 60529	IP 65 (for male EN175301-8 and Binder 714 M18)	803 (DIN 43650)
	IP 67 (for M12x1 male when IP 67 connector is use	n an ed)
Relevant data for Ex applications		Ex nA, ta, tb, tc
Supply voltage	$U_1 = 1228 V$	12 28 V
Max. Input current	II = 100 mA	may nower concurtion
Max. Input power	PI = I VV	< 1 W
Connection capacitance of the sensor	C _i = ≤ 22 nF	
Inductance of the sensor	$L_i = 0 \text{ mH}$	
Insulation voltage 3)	50 V AC, with integrated ov 61000-6-2	ervoltage protection EN
Other data		
Residual ripple of supply voltage	<u>≤ 5 %</u>	
	> 10 million cycles 0 100 % FS	
weight	~ 150 g	
Note: Reverse polarity protection of the supply volt override and short circuit protection are provi FS (Full Scale) = relative to the full measurin 1) 15000 psi only with mechanical connection 2) 4°S with EPM scale 40°S or product	age, excess voitage, ded. g range, B.F.S.L.= B est F it S traig SF 250 CX20, Autoclave	ht Line

-4°F with FPM seal, -40°F on request
 ³⁾ 500 V AC on request

Areas of application:

Code No.for use in Model code	1			9	А	с
Protection type	I M1 Ex ia I Ma	II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 1D Ex ia IIIC T85°C Da	II 2G Ex ia IIC T6 Gb	II 3G Ex nA IIC T6 Gc	II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da II 2D Ex tb IIIC T80°C Db	II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Certificate		KEMA 05ATEX1016 X / KEMA 05ATEX1021				
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II, III Category 1G, 1/2G, 1D Gases/conductive dust Protection class: intrinsically safe ia with barrier	Group II Category 2G Gases Protection class: intrinsically safe ia with barrier	Group II Category 3G Gases Protection class: Non-sparking nA	Group III Category 1D, 2D Conductive dust Protection class: Dustproof enclosure	Group II, III Category 3G, 3D Gases/conductive dust Protection class: Intrinsically safe ic with barrier
Electrical Connection (see model code)	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types II 1D Ex ta IIIC T80/90/100° C Da T₅₀₀T90/T100/T110°C Da, II 2D Ex tb IIIC T80/90/100°C Db and II 3D Ex tc IIIC T80/90/100°C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type II 3G Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:

Bind	er series 714 M18	N 7 ()
		4
Pin	HDA 47X4-A	5
1	n.c.	
2	Signal +	F
3	Signal -	
4	n.c.	S
EN1	75301-803 (DIN 43650)	7 F C 1



Pin	HDA 47X5-A
1	Signal +
2	Signal -
3	n.c.
T	Housing

M12x1

12



Pin HDA 47X6-A

1	Signal +
2	n.c.
3	Signal -
4	n.c.

Ν	lod	e	CC	d	e

HDA 4 7 X X – A – <u>XXXX</u> – A X X – <u>000</u> (PSI)
Mechanical connection 7 = SAE 6, 9/16-18 UNF 2A male C = SF 250 CX20, Autoclave (only for "15000 psi" press. range)
Electrical connection
4 = Male, 4 pole Binder series 714 M18 (connector not supplied)
 5 = Male, 3 pole + PE, EN175301-803 (DIN 43650)
 6 = Male, M12x1, 4 pole (connector not supplied)
 Signal
A = 4 20 mA, 2 conductor
Pressure ranges in psi
Approval A = ATEX
Insulation voltage N = 50 V AC
 Protection types and applications (code) 1 = I M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 1D Ex ia IIIC T85 °C Da
 9 = II 3G Ex nA IIC T6 Gc (only in conjunction with electr. connection "6")*
A = II 1D Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da (only in conjunction with electr. connection "6")* II 2D Ex tb IIIC T80 °C Db
C = II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80 °C Dc
Modification number 000 = Standard
Notes:
* For design and electrical connection see device dimensions
Accessories:
 Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

US 18.335.2/10.17

Protection types and applications (code): 1, C



Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONIC GMBH 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

HYDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4400 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4400 in ATEX version has a stainless steel measurement cell with thin-film strain gauge.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust contamination, e.g. in mills.

Protection types and applications: I M1 Ex ia I Ma

II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 3G Ex nA IIC T6,T5,T4 Gc II 3G Ex ic IIC T6,T5,T4 Gc

II 1D Ex ia IIIC T85 °C Da II 1D Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da II 2D Ex tb IIIC T80/90/100 °C Db II 3D Ex tc IIIC T80/T90/T100 °C Dc II 3D Ex ic IIIC T80/T90/T100 °C Dc

Special features:

- Accuracy ≤ ± 0.5 % FS B.F.S.L.
- Certificates: KEMA 05ATEX1016 X KEMA 05ATEX1021
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4400 ATEX Intrinsically Safe ATEX Dustproof Enclosure ATEX Non-sparking



Technical data:

Toomhour dutu.			
Input data			
Measuring ranges ¹⁾	500, 750, 1000, 1500, 3000, 6000, 9000, 1500	0 psi	
Overload pressures	1160, 1160, 2900, 2900, 7250, 11600, 14500, 23200 psi		
Burst pressures	2900, 2900, 7250, 7250, 14500, 29000, 29000, 43500 ps		
Mechanical connection ¹⁾	SAE 6 9/16-18 UNF2A		
	SF 250 CS20, Autoclave(7/16-20-UNF 2B)		
	other connections upon request		
Torque value	15lb-ft(20Nm) - SAE 6		
	30lb-ft(40Nm) - SF 250 CX20		
Parts in contact with medium	Stainless steel: 1.4542; 1.4571; 1.4435;		
	1.4404; 1.4301		
Output data	Seal: FPM		
Output data			
Output signal, permitted load resistance	420 mA, 2 conductor	01	
	$RL_{max.} = (U_B - 12 V) / 20 \text{ mA} [K]$	Ωj	
Accuracy to DIN 16086,	$\leq \pm 0.5$ % FS typ.		
Max. setting	<u>≤±1%FSIIIdX.</u>		
	$\leq \pm 0.25 \%$ FS typ.		
(D.I.O.L.)	<u><u>s</u> ± 0.00959/ ES/°E tro</u>		
Zero point	$\leq \pm 0.0005\%$ FS/ F lyp. $< \pm 0.014\%$ FS/°F max		
	$\leq \pm 0.0147613711110X.$		
Over range	$\leq \pm 0.0005\%$ FS/ F typ. < $\pm 0.014\%$ FS/°F max		
Non-linearity at max, setting	< + 0.3 % FS max		
to DIN 16086	S ± 0.5 /01 S max.		
Hysteresis	< + 0.4 % ES max		
Popostability	S ± 0.4 % TO HIDX.		
Repeatability Bias time	<u></u>		
Rise line	≤ 1.5 IIIS		
	≤ ± 0.3 % FS typ. / year		
Environmental conditions	4 . 105%		
Compensated temperature range	-4+185°F		
Operating temperature range	-4+140°F		
Storage temperature range	-40 to 212°F		
Fluid temperature range ²⁾	-40+140°F / -4+140°F		
(E mark	EN 61000-6-1/2/3/4		
	EN 60079-0 / 11 / 26 / 31		
	EN 50303		
Vibration resistance to	≤ 20 g		
DIN EN 60066-2-6 al 10 500 HZ		2)	
Protection class to IEC 60529	IP 65 (for male EN1/5301-803 (DIN 43650	J)	
	ID 67 (for M12v1 when on ID 67 connector is	upped)	
Delevent dete fen Ev ennligetiene		useu)	
Supply voltage	$\begin{array}{c c c c c c c c c c c c c c c c c c c $	C	
Supply vollage	01 = 1220 1220 1220 1220		
Max input power	$\frac{11 - 100 \text{ IIIA}}{\text{Pi} = 1 \text{ W}}$	neuntion	
Max. Input power		Isuption	
Connection canacitance of the sensor	$C_{i} = < 22 \text{ nF}$		
Inductance of the sensor	$L_i = 0 \text{ mH}$		
Insulation voltage 3)	50 V AC, with integrated overvoltage prote	ction EN	
	61000-6-2		
Other data			
Residual ripple of supply voltage	≤ 5 %		
Life expectancy	> 10 million cycles		
	0100 % FS		
Weight	~ 150 g		
Note: Reverse polarity protection of the supply ve	oltage, excess voltage,		
FS (Full Scale) = relative to the full measure	ing range B.F.S.L = Best Fit Straight Line		
¹⁾ 15000 psi only with mechanical connection	on SF 250 CX20, Autoclave		

²⁾-4°F with FPM seal, -40°F on request
 ³⁾ 500 V AC on request

Areas of application:

Code No. for use in Model code	1		9	A	с	
Protection type	I M1 Ex ia I Ma	II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 1D Ex ia IIIC T85°C Da	II 2G Ex ia IIC T6 Gb	II 3G Ex nA IIC T6 Gc	II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da II 2D Ex tb IIIC T80°C Db	II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Certificate	KEMA 05ATEX1016 X / KEMA 05ATEX1021					
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II, III Category 1G, 1/2G, 1D Gases/conductive dust Protection class: intrinsically safe ia with barrier	Group II Category 2G Gases Protection class: intrinsically safe ia with barrier	Group II Category 3G Gases Protection class: Non-sparking nA	Group III Category 1D, 2D Conductive dust Protection class: Dustproof enclosure	Group II, III Category 3G, 3D Gases/conductive dust Protection class: Intrinsically safe ic with barrier
Electrical Connection (see model code)	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types II 1D Ex ta IIIC T80/90/100° C Da T₅₀₀T90/T100/T110° C Da, II 2D Ex to IIIC T80/90/100° C Db and II 3D Ex tc IIIC T80/90/100° C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type II 3G Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:

Ding			
Pin	HDA 44X4-A		
1	n.c.		
2	Signal +		
3	Signal -		
4	n.c.		
EN175301-803 (DIN 43650)			



Pin	HDA 44X5-A
1	Signal +
2	Signal -
3	n.c.
T	Housing

M12x1

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Pin	HDA 44X6-A
1	Signal +
2	n.c.
3	Signal -
4	n.c.

Model code:

	HDA 4 4 X X – A – <u>XXXX</u> – A N X – <u>000</u> (PSI)
	Mechanical connection 7 = SAE 6 9/16-18 UNF2A C = SF 250 CX20, Autoclave (only for "15000 psi" press. range)
I	Electrical connection
	4 = Male 4 pole Binder series 714 M18
	5 = Male 3 pole + PE, EN175301-803 (DIN 43650)
	(connector supplied)
	6 = Male M12x1, 4 pole
	Signal
	A = 4 20 mA, 2 conductor
	Pressure ranges in psi
	0500, 0750, 1000, 1500, 3000, 5000, 6000, 9000 15000 psi (only in conjunction with mechanical connection type "C")
	Approval
	A = ATEX
	Insulation voltage
	N = 50 V AC
	1 = I M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 1D Ex ia IIIC T85 °C Da
	9 = II 3G Ex nA IIC T6 Gc (only in conjunction with electr. conn. "6")*
	A = II 1D Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da (only in conjunction with electr. conn. "6")* II 2D Ex tb IIIC T80 °C Db
	C = II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80 °C Dc
	Modification number
	Notes:
	* For design and electrical connection see device dimensions
	Accessories
	ACCESSURES.

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

US 18.336.2/10.17

Protection types and applications (code): 1, C



required for electrical connection, e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog.

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com



Description:

The pressure transmitter HDA 4300 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the ATEX version HDA 4300 has a ceramic measurement cell with thick-film strain gauge.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust contamination, e.g. in mills.

Protection types and applications: I M1 Ex ia I Ma

II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 3G Ex nA IIC T6, T5, T4 Gc II 3G Ex ic IIC T6, T5, T4 Gc

II 1D Ex ia IIIC T85 °C Da II 1D Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da II 2D Ex tb IIIC T80/90/100 °C Db II 3D Ex tc IIIC T80/T90/T100 °C Dc II 3D Ex ic IIIC T80/T90/T100 °C Dc

Special features:

- Accuracy $\leq \pm 0.5$ % FS B.F.S.L.
- Certificates: KEMA 05ATEX1016 X KEMA 05ATEX1021
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4300 **ATEX Intrinsically Safe** ATEX Dustproof Enclosure ATEX Non-sparking



Technical data:

Input data				
Measuring ranges	-14.5 to 135.5, 15, 30, 50, 100, 150, 250, 500 psi			
Overload pressures	450, 45, 100, 150, 290, 450, 725, 1500 psi			
Burst pressures	650, 70, 150, 250, 400, 650, 1000, 2500 psi			
Mechanical connection	1/4-18 NPT male			
Torque value	30 ft-lb (40 Nm)			
Parts in contact with medium	Sensor: (Ceramic		
	Mech. connection:	1.4301		
	Seal: F	FPM / EPDM		
Output data				
Output signal, permitted	4 20 mA, 2 conductor			
load resistance	RLmax.= (UB - 12)	/) / 20 mA [kΩ]		
Accuracy to DIN 16086,	≤ ± 0.5 % FS typ.			
Max. setting	$\leq \pm 1$ % FS max.			
Accuracy at min. setting	≤ ± 0.25 % FS typ.			
(B.F.S.L.)	$\leq \pm 0.5 \%$ FS max.			
Iemperature compensation	$\leq \pm 0.012\%$ FS/°F typ.			
Zero point	$\leq \pm 0.017\%$ FS/°F max.			
Temperature compensation	≤ ± 0.012% FS/°F typ.			
Over range	$\leq \pm 0.017\%$ FS/°F max.			
to DIN 16086	$\leq \pm 0.5 \%$ FS max.			
Hysteresis	≤ ± 0.4 % FS max.			
Repeatability	≤ ± 0.1 % FS			
Rise time	≤ 1.5 ms			
Long-term drift	≤ ± 0.3 % FS typ. / year			
Environmental conditions				
Compensated temperature range	-4+185°F			
Operating temperature range	-4+140°F			
Storage temperature range	-40 to 212°F			
Fluid temperature range ¹⁾	-40+140°F / -4+140°F			
(Emark	EN 61000-6-1 / 2 / 3 / 4			
	EN 60079-0 / 11 / 26 / 31			
	EN 50303			
Vibration resistance to	≤ 20 g			
DIN EN 60068-2-6 at 10 500 Hz				
Protection class to IEC 60529	IP 65 (for male EN17530	1-803 (DIN 43650) and		
	Binder 714 M18)			
	IP 67 (for M12x1, when a	n IP 67 connector is used)		
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc		
Supply voltage	UI = 1228 V	12 28 V		
Max input current Max input power	t current II = 100 mA t power $Pi = 1.W$ may power concuption			
Max. Input power	11 - 1 00	≤ 1 W		
Connection capacitance of the sensor	C _i = ≤ 22 nF			
Inductance of the sensor	$L_i = 0 \text{ mH}$			
Insulation voltage 2)	50 V AC, with integrated or 61000-6-2	vervoltage protection EN		
Other data	01000 0 2			
Residual ripple of supply voltage	≤ 5 %			
Life expectancy	> 10 million cycles			
	0100 % FS			
vveight	~ 180 g			
Note. Reverse polarity protection of the supply ve	onage, excess vonage,			

FS (Full Scale) = relative to the full measuring range, B.F.S.L. = Best Fit Straight Line $^{1)}$ -4°F with FPM or EPDM seal, -40°F on request $^{2)}$ 500 V AC on request

Areas of application:

Code No.for use in Model code	1		9	А	с	
Protection type	I M1 Ex ia I Ma	II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 1D Ex ia IIIC T85°C Da	II 2G Ex ia IIC T6 Gb	II 3G Ex nA IIC T6 Gc	II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da II 2D Ex tb IIIC T80°C Db	II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Certificate	KEMA 05ATEX1016 X / KEMA 05ATEX1021					
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II, III Category 1G, 1/2G, 1D Gases/conductive dust Protection class: intrinsically safe ia with barrier	Group II Category 2G Gases Protection class: intrinsically safe ia with barrier	Group II Category 3G Gases Protection class: Non-sparking nA	Group III Category 1D, 2D Conductive dust Protection class: Dustproof enclosure	Group II, III Category 3G, 3D Gases/conductive dust Protection class: Intrinsically safe ic with barrier
Electrical Connection (see model code)	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types II 1D Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da, II 2D Ex tb IIIC T80/90/100 °C Db and II 3D Ex tc IIIC T80/90/100 °C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type II 3G Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:

Binder series 714 M18	HDA 4 3 X X – A – <u>XXXX</u> – A X X – <u>000</u> –X1(PSI)
	Mechanical connection 8 = 1/4-18 NPT male Electrical connection 4 = Male, 4 pole Binder series 714 M18 (connector not supplied) 5 = Male, 3 pole + PE, EN175301-803 (DIN 43650)
Pin HDA 4384-A	(connector supplied) 6 = Male M12x1, 4 pole
1 n.c.	(connector not supplied)
2 Signal +	Signal
3 Signal -	Pressure ranges in psi
4 n.c.	0135 (-14.5 to 135.5 psi), 0015, 0030, 0050, 0100,
EN175301-803 (DIN 43650)	A = ATEX Insulation voltage N = 50 V AC Protection types and applications (code) 1 = I M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 2D Ex ia IIC T85°C Da
Pin HDA 4385-A	9 = 11.3G Ex nA IIC T6 Gc
1 Signal +	(only in conjunction with electr. conn. "6")*
2 Signal -	A = II 1D Ex ta IIIC T80°C T_{500} T90°C Da

- 3 n.c.
- \bot Housing

M12x1



Pin	HDA 4386-A
1	Signal +
2	n.c.
3	Signal -
4	n.c.

Model code:

Mechanical connection 8 = 1/4-18 NPT male Electrical connection 4 = Male, 4 pole Binder series 714 M18 (cornection series)
5 = Male, 3 pole + PE, EN175301-803 (DIN 43650)
 (connector supplied) 6 = Male, M12x1, 4 pole (connector not supplied)
 Signal A = 4 20 mA, 2 conductor
 Pressure ranges in psi
Approval A = ATEX
N = 50 V AC
Protection types and applications (code)
 9 = II 3G Ex nA IIC T6 Gc (only in conjunction with electr. conn. "6")*
 A = II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da (only in conjunction with electr. conn. "6")* II 2D Ex tb IIIC T80°C Db
 C = II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Modification number
Seal material (in contact with fluid) F = FPM seal (e.g.: for hydraulic oils) E = EPDM seal (e.g.: for refrigerants) Material of connection (in contact with fluid) 1 = Stainless steel
Notes: * For design and electrical connection see device dimensions
 Accessories: Appropriate accessories, such as electrical connectors can be found in the Accessories brochure.

US 18.337.2/10.17

Protection types and applications (code): 1, C



required for electrical connection; e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For European mechanical connection and bar ranges see European Catalog.

90 Southland Dr. Bethlehem, PA 18017

Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

IDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4100 in ATEX version has been specially developed for use in potentially explosive atmospheres for absolute measurement in the low pressure range and is based on the HDA 4000 series.

As with the industry model, the ATEX version HDA 4100 has a ceramic measurement cell with thick-film strain gauge.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust contamination, e.g. in mills.

Protection types and applications: I M1 Ex ia I Ma

II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 3G Ex nA IIC T6, T5, T4 Gc II 3G Ex ic IIC T6, T5, T4 Gc

II 1D Ex ia IIIC T85 °C Da II 1D Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da II 2D Ex tb IIIC T80/90/100 °C Db II 3D Ex tc IIIC T80/T90/T100 °C Dc II 3D Ex ic IIIC T80/T90/T100 °C Dc

Special features:

• Accuracy $\leq \pm 0.5$ % FS B.F.S.L.

 Certificates: KEMA 05ATEX1016 X KEMA 05ATEX1021

- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Absolute Pressure Transmitter HDA 4100 **ATEX Intrinsically Safe** ATEX Dustproof housing ATEX Non-sparking

| Technical data:

Input data			
Measuring ranges	15, 50 psia		
Overload pressures	45, 150 psia		
Burst pressures	70, 250 psia		
Mechanical connection	1/4-18 NPT male		
Torque value	30 ft-lb (40 Nm)		
Parts in contact with medium	Sensor: Ce	eramic	
	Mech. connection: 1.4	4301	
	Seal: FF	PM / EPDM	
Output data			
Output signal, permitted load resistance	4 20 mA, 2 conducto R _{Lmax} = (L	or J₅ - 12 V) / 20 mA [kΩ]	
Accuracy to DIN 16086,	≤ ± 0.5 % FS typ.		
Max. setting	≤ ± 1 % FS max.		
Accuracy at min. setting	≤ ± 0.25 % FS typ.		
(B.F.S.L.)	≤ ± 0.5 % FS max.		
Temperature compensation	≤ ± 0.012% FS/°F typ.		
Zero point	≤ ± 0.017% FS/°F max	κ.	
Temperature compensation	≤ ± 0.012% FS/°F typ.		
Over range	$\leq \pm 0.017\%$ FS/°F max	κ.	
Non-linearity at max. setting to DIN 16086	≤ ± 0.5 % FS max.		
Hysteresis	≤ ± 0.4 % FS max.		
Repeatability	≤ ± 0.1 % FS		
Rise time	≤ 1.5 ms		
Long-term drift	≤ ± 0.3 % FS typ. / yea	ar	
Environmental conditions			
Compensated temperature range	-4+185°F		
Operating temperature range	-4+140°F		
Storage temperature range	-40 to 212°F		
Fluid temperature range ¹⁾	-40+140°F / -4+140	°F	
(E mark	EN 61000-6-1 / 2 / 3 /	4	
	EN 60079-0 / 11 / 26 /	31	
	EN 50303		
Vibration resistance to	≤ 20 g		
DIN EN 60068-2-6 at 10 500 Hz			
Protection class to IEC 60529	IP 65 (for male EN175	301-803 (DIN 43650)	
	and Binder 714	M18)	
	IP 67 (for M12x1, whe	n an IP 67 connector is used)	
Relevant data for Ex applications		Ex nA, ta, tb, tc	
Supply voltage	UI = 1228 V	12 28 V	
Max input power	$P_i = 1 W$	max nower consumption $\leq 1 W$	
Connection capacitance of the sensor	$C_{i} = < 22 \text{ nE}$		
Inductance of the sensor	$L_i = 0 \text{ mH}$		
Insulation voltage 2)	50 V AC, with integrated	d overvoltage protection EN	
Other data			
Residual ripple of supply voltage	≤ 5 %		
Life expectancy	> 10 million cycles		
10/-:	0100 % FS		
weight	<u>~ 180 g</u>		
Note: Reverse polarity protection of the supply vo override and short circuit protection are pro	oltage, excess voltage, ovided.	.	

FS (Full Scale) = relative to the full measuring range, B.F.S.L.= Best Fit Straight Line ¹⁾ -4 °F with FPM or EPDM seal, -40 °F on request ²⁾ 500 V AC on request

Areas of application:

Code No.for use in Model code	1			9	А	с
Protection type	I M1 Ex ia I Ma	II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 1D Ex ia IIIC T85°C Da	II 2G Ex ia IIC T6 Gb	II 3G Ex nA IIC T6 Gc	II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da II 2D Ex tb IIIC T80°C Db	II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Certificate	KEMA 05ATEX1016 X / KEMA 05ATEX1021					
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II, III Category 1G, 1/2G, 1D Gases/conductive dust Protection class: intrinsically safe ia with barrier	Group II Category 2G Gases Protection class: intrinsically safe ia with barrier	Group II Category 3G Gases Protection class: Non-sparking nA	Group III Category 1D, 2D Conductive dust Protection class: Dustproof enclosure	Group II, III Category 3G, 3D Gases/conductive dust Protection class: Intrinsically safe ic with barrier
Electrical Connection (see model code)	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types II 1D Ex ta IIIC T80/90/100° C Da T₅₀₀T90/T100/T110°C Da, II 2D Ex tb IIIC T80/90/100°C Db and II 3D Ex tc IIIC T80/90/100°C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type II 3G Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Model code:

Pin connections:

Binder series 714 M18	HDA 4 1 X X – A – <u>XXXX</u> – A X X – <u>000</u> –X1(PSI)
	Mechanical connection 8 = 1/4-18 NPT male Electrical connection 4 = Male, 4 pole Binder series 714 M18 (connector not supplied) 5 = Male, 3 pole + PE, EN125201 902 (DIN 42650)
Pin HDA 4184-A	(connector supplied)
1 n.c.	6 = Male, M12x1, 4 pole
2 Signal +	Signal
3 Signal -	A = 4 20 mA, 2 conductor
4 n.c.	Pressure ranges in psia
EN1475004 000 (DIN 40050)	
EN175301-803 (DIN 43650)	A = ATEX
	Insulation voltage
	Protection types and applications (code) 1 = I M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 1D Ex ia IIIC T85 °C Da
Pin HDA 4185-A	9 = II 3G Ex nA IIC T6 Gc
1 Signal +	(only in conjunction with electr. connection "6")*
2 Signal -	A = II 1D Ex ta IIIC 180 °C 1 ₅₀₀ 190 °C Da (only in conjunction with electr. connection $.6^{(*)}$ *
3 n.c.	II 2D Ex tb IIIC T80 °C Db
⊥ Housing	C = II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80 °C Dc
M12x1	Modification number

000 = Standard

= Stainless steel

in the Accessories brochure.

F

1

Notes:

Accessories:

Seal material (in contact with fluid) -

= FPM seal (e.g.: for hydraulic oils) E = EPDM seal (e.g.: for refrigerants)

Material of connection (in contact with fluid) -

* For design and electrical connection see device dimensions

Appropriate accessories, such as electrical connectors can be found



Pin	HDA 4186-A
1	Signal +
2	n.c.
3	Signal -
4	n.c.

US 18.338.2/10.17



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection; e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part. No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For European mechanical connection and bar ranges see European Catalog.

HYDAC ELECTRONICS

90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

HYDAD INTERNATIONAL



Description:

The programmable pressure switch EDS 4400 in ATEX version has been specially developed for use in potentially explosive atmospheres, and is based on the EDS 4000 series.

The switching point and switchback point, the function of the switching outputs as N/C or N/O and the switching delay are userprogrammable in conjunction with the HYDAC Programming Unit HPG 3000.

As with the industry model, the programmable EDS 4400 in ATEX version has a stainless steel measurement cell with thin-film strain gauge for measuring relative pressure in the high pressure range.

With approval for the following **Protection types and applications:**

ll 1G	Ex ia IIC T4, T5, T6
II 1/2G	Ex ia IIC T4, T5, T6
ll 2G	Ex ia IIC T4, T5, T6
ll 1 D	Ex iaD 20 T100°C

almost all requirements are covered regarding ignition group, error class and temperature class.

Versions for other Protection types and applications are available upon request.

Special features:

- Switching point and switch-back point are user-programmable
- Accuracy $\leq \pm 0.5\%$ FS B.F.S.L.
- Certificates: DEKRA EXAM BVS 07 ATEX E 041 X
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Switch EDS 4400 Programmable ATEX Intrinsically Safe



Technical data:

Input data			
Measuring ranges	1000, 3000, 6000, 9000 psi		
Overload pressures	2900, 7250, 11600, 14500 psi		
Burst pressure	7250, 14500, 29000, 29000 psi		
Mechanical connection	SAE 6 9/16-18 UNF 2A		
Torque value	15lb-ft(20Nm)		
Parts in contact with medium	Stainless steel: 1.4542; 1.4571; 1.	.4435;	
	1.4404; 1.4301		
	Seal: FPM		
Output data			
Switch output	1 x PNP N/C or N/O		
Output load	during operation: $I_{max} \leq 34 \text{ mA}$		
Switching points	user-programmable with HYDAC		
	Programming Unit HPG 3000		
Accuracy to DIN 16086,	≤ ± 0.5 % FS typ.		
Max. setting	≤ ± 1 % FS max.		
Repeatability (at 77 °F)	≤ ± 0.1 % FS max.		
Temperature driπ	$\leq \pm 0.017\%$ FS/°F max. zero point		
Dising switch point and folling	$\leq \pm 0.017\%$ FS/F max. range	with	
switch point dolay	VDAC Programming Unit HPC 2000	WILLI	
Long term drift	A to 3 % ES two / year		
Environmental conditions			
Storage temperature range	-10 to 212°E		
Fluid temperature range	-40102121 -40102121		
	EN 61000-6-1 / 2 / 3 / 4		
	EN 60079-0 / 11 / 26		
	EN 61241-0 / 11		
	EN 50303		
Vibration resistance to	EN 50303 ≤ 20 q		
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	EN 50303 ≤ 20 g		
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto s	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto s I M1	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto s I M1 II 1G, 1/2G, 2G	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto s I M1 II 1G, 1/2G, 2G 14 28 V DC	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto s I M1 II 1G, 1/2G, 2G 14 28 V DC T6:4+140°F	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto s IM1 II 1G, 1/2G, 2G 14 28 V DC T6: -4+140°F T5: T4: -4+158°F	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connectors I M1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connectors S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T6: -4+140°F T6: -4+140°F	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector s IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T6: -4+158°F T100: -4+158°F	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector s IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T6: -4+158°F T6: +1.410°F T6: +1.410°F	T100: +158°E	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature T _a	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector s IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +140°F	or is used)	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature T _a	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector s IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA	T100: +158°F	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature Ta Max. input current Max. input current	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector s IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 0.0 mA 0.7 W	T100: +158°F	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature T _a <u>Max. input current</u> Max. input power Max. input power	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector s IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 pE	T100: +158°F 93 mA 0.65 W	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature T _a Max. input current Max. input power Max. internal capacitance Max internal inductance	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connectors S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F T6: +140°F T5, T4: +158°F 0 mH	T100: +158°F 93 mA 0.65 W 33 nF 0 mH	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature T _a Max. input current Max. input power Max. internal capacitance Max. internal inductance Max. internal inductance	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 V AC with integrated overvoltage prot	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6.2	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature T _a Max. input current Max. input power Max. internal capacitance Max. internal inductance Insulation voltage ¹⁾ Approved intrinsic safety barriers	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 V AC, with integrated overvoltage prot Penperl & Euchs: 7 787	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6-2	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature Ta Max. input current Max. input current Max. input power Max. internal capacitance Max. internal inductance Insulation voltage ¹⁾ Approved intrinsic safety barriers	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connecto S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 V AC, with integrated overvoltage prot Pepperl & Fuchs: Z 787 Telematic Fx STOCK: MTL 7087	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6-2	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature Ta Max. input current Max. input power Max. internal capacitance Max. internal inductance Insulation voltage ¹⁾ Approved intrinsic safety barriers Other data	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 VAC, with integrated overvoltage prot Pepperl & Fuchs: Z 787 Telematic Ex STOCK: MTL 7087	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6-2	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Operating temperature range Max. ambient temperature Ta Max. input current Max. input current Max. input power Max. internal capacitance Max. internal inductance Insulation voltage ¹⁾ Approved intrinsic safety barriers Other data Residual ripple of supply voltage	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 V AC, with integrated overvoltage prot Pepperl & Fuchs: Z 787 Telematic Ex STOCK: MTL 7087 S %	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6-2	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Øperating temperature range Max. ambient temperature Ta Max. input current Max. input current Max. input power Max. internal capacitance Max. internal inductance Insulation voltage ¹⁾ Approved intrinsic safety barriers Øther data Residual ripple of supply voltage Life expectancy	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 V AC, with integrated overvoltage prot Pepperl & Fuchs: Z 787 Telematic Ex STOCK: MTL 7087 $\leq 5\%$ > 10 million cycles	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6-2	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Øperating temperature range Max. ambient temperature Ta Max. input current Max. input current Max. internal capacitance Max. internal capacitance Max. internal inductance Insulation voltage ¹⁾ Approved intrinsic safety barriers Øther data Residual ripple of supply voltage Life expectancy	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 V AC, with integrated overvoltage prot Pepperl & Fuchs: Z 787 Telematic Ex STOCK: MTL 7087 $\leq 5\%$ > 10 million cycles 0100 % FS	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6-2	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz Protection class to IEC 60529 Relevant data for Ex application Supply voltage Compensated temperature range Øperating temperature range Max. ambient temperature T _a Max. input current Max. input current Max. internal capacitance Max. internal capacitance Max. internal inductance Insulation voltage ¹⁾ Approved intrinsic safety barriers Other data Residual ripple of supply voltage Life expectancy Weight	EN 50303 ≤ 20 g IP 67 (M12x1, when an IP 67 connector S IM1 II 1G, 1/2G, 2G 1428 V DC T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T6: -4+140°F T5, T4: -4+158°F T100: -4+158°F T100: -4+158°F T6: +140°F T5, T4: +158°F 100 mA 0.7 W 33 nF 0 mH 50 V AC, with integrated overvoltage prot Pepperl & Fuchs: Z 787 Telematic Ex STOCK: MTL 7087 $\leq 5\%$ > 10 million cycles 0100 % FS ~ 150 g	T100: +158°F 93 mA 0.65 W 33 nF 0 mH ection EN 61000-6-2	

Te: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided. FS (Full Scale) = relative to the complete measuring range ¹⁾ 500 V AC on request

Setting options:

In conjunction with the HYDAC Programming Unit HPG 3000, all the settings are combined in an easy-to-follow menu.

Setting ranges for the switch outputs:

Measuring range in psi	Increment in psi
0 1000	2
03000	5
0 6000	10
09000	20

The switch point (upper switch value) on all instruments is between 5 % and 100 % of the measuring range and the switch-back point (lower switch value) is between 1 % and 96 % of the measuring range.

	Minimum value in ms	Maximum value in ms
Switch-on delay Ton1/Ton2	8	2040
Switch-off delay ToF1/ToF2	8	2040

The increment for all instruments is 8 ms.

Pin connections:

M12x1, 5 pole

12



Pin	Process connection	HPG connection	
1	+U _B	+U _B	
2	0 V	Comport 1 *	
3	0 V	0 V	
4	Out 1	n.c.	
5	0 V	Comport 2 *	
* Comport = programming connection			

Comport = programming connection

Areas of application:

Code No. for use in Model code	1	2	3	8
Protection Type	I M1 Ex ia I	II 1G Ex ia IIC T4, T5, T6	II 2G Ex ia IIC II 1/2G Ex ia IIC T4, T5, T6	Ⅱ 1D Ex iaD 20 T100 °C
Certificate	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II Category 1G Gases Protection class: intrinsically safe ia with barrier For use in Zone 0 T4, T5: $T_a = 70 \degree C$ T6: $T_a = 60 \degree C$	Group II Category 2G, 1/2G Gases Protection class: intrinsically safe ia with barrier For use in Zone 1, 2 For mounting to Zone 0 T4, T5: $T_a = 70$ °C T6: $T_a = 60$ °C	Group II Category iD Dusts Protection class: intrinsically safe ia with barrier For use in Zone 20, 21, 22 For mounting to Zone 20 T100: $T_a = 70 \text{ °C}$
Electrical Connection	8	8	8	8

Instruments for other Protection types and applications are available on request. Please contact our technical sales department for more information.

Model code:

EDS 4 4 7 8 - $XXXX$ - X - A X X - 000	<u>)</u> (PSI)
Mechanical connection 7 = SAE 6 9/16-18 UNF2A	
Electrical connection 8 = Male M12x1, 5 pole (connector not supplied)	
Pressure ranges in psi	
Switching output P = Programmable	
Approval	
Insulation voltage	
Protection types and applications (code) 1 = I M1 Ex ia I 2 = II 1G Ex ia IIC T4, T5, T6 3 = II 2G Ex ia IIC T4, T5, T6 / II 1/2G Ex ia IIC T4, T5, T6 8 = II 1D Ex iaD 20 T100 °C	
Modification number	

000 =Standard

Accessories:

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

Safety instructions:

- These units must only be programmed outside the potentially explosive location.
- When operating in potentially explosive locations, the programming cables may only be connected to the 0 V outside of the potentially explosive area.
- The switching output draws the switching energy from the power supply to the pressure switch. No additional energy is introduced into the electrical circuit through the switching output.
- The dual Zener barriers specified and approved in the technical data must be used to connect the pressure switch.
 These have a reverse polarity diode to decouple the signal.
 The signal path may only be passively loaded.
- Ensure that measured fluids in contact with the pressure switch are compatible with the materials used.

Dimensions:



Programming Unit:

(must be ordered separately)

HPG 3000 – 000 Portable Programming Unit Part. No. 909 422

HPG 3000 Power Supply with connector: Part no. 02091103



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25.2

M12x1

Caution:

The HPG 3000 Programming Unit may only be used <u>outside</u> the potentially explosive area.

Note:

The information in this brochure relates to the operating conditions and

applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog.

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com JS 18.339.2/10.17

HYDAD INTERNATIONAL



Description:

The programmable pressure switch EDS 4300 in ATEX version was specially developed for use in potentially explosive atmospheres and is based on the EDS 4000 series.

The switching point and switchback point, the function of the switching outputs as N/C or N/O and the switching delay are userprogrammable in conjunction with the HYDAC Programming Unit HPG 3000.

As with the industry model, the programmable EDS 4300 in ATEX version has a ceramic measurement cell with thick-film strain gauge for measuring relative pressure in the low pressure range.

With approval for the following **Protection types and applications:** I M1 Ex ia I

 II 1G
 Ex ia
 IIC T4, T5, T6

 II 1/2G
 Ex ia
 IIC T4, T5, T6

 II 2G
 Ex ia
 IIC T4, T5, T6

 II 1 D
 Ex ia
 IIC 74, T5, T6

almost all requirements are covered regarding ignition group, error class and temperature class.

Versions for other Protection types and applications are available on request.

Special features:

- Switching point and switch-back point user-programmable
- Accuracy ≤ ± 0.5% FS B.F.S.L.
- Certificates: DEKRA EXAM BVS 07 ATEX E 041 X
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Switch EDS 4300 Programmable ATEX Intrinsically Safe



Technical data:

reennear aata.		
Input data		
Measuring ranges	15, 50, 100, 150, 250, 500 psi	
Overload pressures	45, 150, 290, 450, 725, 1500 psi	
Burst pressures	70, 250, 400, 650, 1000, 2500 psi	
Mechanical connection	1/4-18 NPT	
Torque value	15lb-ft (20 Nm)	
Parts in contact with medium	Sensor: Ceramic	
	Mech. connection: 1.4301	
	Seal: FPM / EPDM	
Output data		
Switch output	1 x PNP N/C or N/O	
Output load	during operation: I _{max} ≤ 34 mA	
Switching points	user-programmable with HYDAC	
Programming Unit HPG 3000		
Accuracy to DIN 16086,	≤ ± 0.5 % FS typ.	
Max. setting	≤ ± 1 % FS max.	
Repeatability (at 77 °F)	≤ ± 0.1 % FS max.	
Temperature drift	≤ ± 0.017% /°F max. zero point	
	≤ ± 0.017% /°F max. range	
Rising switch point and falling	8 ms to 2000 ms; user-programmal	ble with
switch point delay	HYDAC Programming Unit HPG 30	000
Long-term drift	≤ ± 0.3 % FS typ. / year	
Environmental conditions	21 2	
Storage temperature range	-40 to 212°F	
Fluid temperature range	-4+140°F/+158°F/+185°F	
(f mark	EN 61000-6-1 / 2 / 3 / 4	
	EN 60079-0 / 11 / 26	
	EN 61241-0 / 11	
	EN 50303	
Vibration resistance to	≤ 20 g	
DIN EN 60068-2-6 at 10 500 Hz	-	
Protection class to IEC 60529	IP 67	
	(M12x1, when an IP 67 connector i	s used)
Relevant data for Ex applications		
	I M1	II 1 D
	ll 1G, 1/2G, 2G	
Supply voltage	14 28 V DC	
Compensated temperature range	T6: -4+140°F	
	T5, T4: -4+158°F	
	<u>T100: -4+158°F</u>	
Operating temperature range	T6: -4+140°F	
	15, 14: -4+158°F	
	<u>1100: -4+158°F</u>	T100 115005
Max. ambient temperature 1a	16: +140°F	1100: +158°F
	15, 14: +158°F	
Max. input current	100 mA	93 mA
Max. input power	0.7 W	0.65 W
Max. internal capacitance	33 nF	33 nF
Max. internal inductance	0 mH	0 mH
Insulation voltage ¹⁾	50 V AC, with integrated overvoltage	le
	protection EN 61000-6-2	
Approved intrinsic safety barriers	Pepperl & Fuchs: Z 787	
	Telematic Ex STOCK: MTL 7	087
Other data		
Residual ripple of supply voltage	≤ 5 %	
Life expectancy	> 10 million cycles	
	0 100 % FS	
Weight	~ 150 g	
Note: Reverse polarity protection of the si	upply voltage excess voltage override	

Et: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided. FS (Full Scale) = relative to the full measuring range ¹⁾ 500 V AC on request

Setting options:

In conjunction with the HYDAC Programming Unit HPG 3000, all the settings are combined in an easy-to-follow menu.

Setting ranges for the switch outputs:

Measuring range in psi	Increment in psi
015	0.05
050	0.05
0100	0.2
0250	0.5
0500	1

The switch point (upper switch value) on all instruments is between 5 % and 100 % of the measuring range and the switch-back point (lower switch value) is between 1 % and 96 % of the measuring range.

	Minimum value in ms	Maximum value in ms
Switch-on delay Ton1/Ton2	8	2040
Switch-off delay ToF1/ToF2	8	2040

The increment for all instruments is 8 ms.

Pin connections:

M12x1, 5 pole

12

Pin	Process connection	HPG connection	
1	+U _B	+U _B	
2	0 V	Comport 1 *	
3	0 V	0 V	
4	Out 1	n.c.	
5	0 V	Comport 2 *	
Con	an art - ara araa	mine composition	

* Comport = programming connection

Areas of application:

Code No. for use in Model code	1	2	3	8
Protection Type	I M1 Ex ia I	II 1G Ex ia IIC T4, T5, T6	II 2G Ex ia IIC II 1/2G Ex ia IIC T4, T5, T6	II 1D Ex iaD 20 T100 °C
Certificate	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II Category 1G Gases Protection class: intrinsically safe ia with barrier For use in Zone 0 T4, T5: $T_a = 70 \degree C$ T6: $T_a = 60 \degree C$	Group II Category 2G, 1/2G Gases Protection class: intrinsically safe ia with barrier For use in Zone 1, 2 For mounting to Zone 0 T4, T5: $T_a = 70$ °C T6: $T_a = 60$ °C	Group II Category iD Dusts Protection class: intrinsically safe ia with barrier For use in Zone 20, 21, 22 For mounting to Zone 20 T100: T _a = 70 °C
Electrical Connection	8	8	8	8

Instruments for other Protection types and applications are available on request. Please contact our technical sales department for more information.

Model code:

EDS 4 3 8 8 - <u>XXXX</u> - X - AX X - <u>000</u> - X1(PSI)
Mechanical connection 8 = 1/4-18 NPT, male Other connections upon request
Electrical connection 8 = Male M12x1, 5 pole (connector not supplied)
Pressure ranges in psi
Switching output P = Programmable
Approval A = ATEX
Insulation voltage N = 50 V AC
Protection types and applications (code) 1 = I M1 Ex ia I 2 = II 1G Ex ia IIC T4, T5, T6 3 = II 2G Ex ia IIC T4, T5, T6 / II 1/2G Ex ia IIC T4, T5, T6 8 = II 1D Ex iaD 20 T100 °C
Modification number 000 = Standard
Seal material (in contact with fluid) F = FPM seal (e.g.: for hydraulic oils) F = FPDM seal (e.g.: for refrigerants)

Material of connection (in contact with fluid) -

1 = Stainless steel

Accessories:

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.
Safety instructions:

- These units must only be programmed outside the potentially explosive location.
- When operating in potentially explosive locations, the programming cables may only be connected to the 0 V outside of the potentially explosive area.
- The switching output draws the switching energy from the power supply to the pressure switch. No additional energy is introduced into the electrical circuit through the switching output.
- Dual Zener barriers specified and approved in the technical data must be used to connect the pressure switch.
 These have a reverse polarity diode to decouple the signal.
 The signal path may only be passively loaded.
- Ensure that measured fluids in contact with the pressure switch are compatible with the materials used.

Dimensions:



Programming Unit:

(must be ordered separately) HPG 3000 – 000 Portable Programming Unit

Part No. 909 422 HPG 3000 Power Supply with connector: Part No. 02091103



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Caution:

The HPG 3000 Programming Unit may only be used <u>outside</u> the potentially explosive area.

Note:

The information in this brochure relates to the operating conditions and

applications described.

- For applications or operating conditions not described, please contact the relevant technical department.
- Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS

Telephone +1 (610) 266-0100

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90 Southland Dr. Bethlehem, PA 18017

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HYDAD INTERNATIONAL



Description:

The programmable pressure switch EDS 4100 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the EDS 4000 series.

The switching point and switchback point, the function of the switching outputs as N/C or N/O and the switching delay are userprogrammable in conjunction with the HYDAC Programming Unit HPG 3000.

As with the industry model, the programmable EDS 4100 in ATEX version has a ceramic measurement cell with thick-film strain gauge for measuring absolute pressure in the low pressure range.

With approval for the following **Protection types and applications:**

ll 1G	Ex ia IIC T4, T5, T6	
II 1/2G	Ex ia IIC T4, T5, T6	
ll 2G	Ex ia IIC T4, T5, T6	
ll 1 D	Ex iaD 20 T100 °C	

almost all requirements are covered regarding ignition group, error class and temperature class.

Versions for other Protection types and applications are available on request.

Special features:

- Switching point and switch-back point user-programmable
- Accuracy $\leq \pm 0.5\%$ FS B.F.S.L.
- Certificates:
- DEKRA EXAM BVS 07 ATEX E 041 X
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Absolute Pressure Switch EDS 4100 Programmable ATEX Intrinsically Safe



Technical data:

Input data			
Measuring ranges	15. 50 psia		
Overload pressures	40, 150 psia		
Burst pressures	70, 250 psia		
Mechanical connection	1/4-18 NPT		
Torque value	15lb-ft (20 Nm)		
Parts in contact with medium	Sensor: Ceram	ic	
	Mech. connection: 1.4301		
	Seal: FPM /	EPDM	
Output data			
Switch output	1 x PNP N/C or N/O		
Output load	during operation: I _{max} ≤ 34 r	nA	
Switching points	user-programmable with HY	DAC Programming Unit	
HPG 3000			
Accuracy to DIN 16086,	≤ ± 0.5 % FS typ.		
Max. setting	≤ ± 1 % FS max.		
Repeatability (at 77 °F)	≤ ± 0.1 % FS max.		
Temperature drift	≤ ± 0.017% /°F max. zero p	oint	
	≤ ± 0.017% /°F max. range		
Rising switch point and falling	8 ms to 2000 ms; user-prog	rammable with	
switch point delay	HYDAC Programming Unit	HPG 3000	
Long-term drift	≤ ± 0.3 % FS typ. / year		
Environmental conditions			
Storage temperature range	-40 to 212°F		
Fluid temperature range	-4+140°F/+158°F/+185°F		
(e mark	EN 61000-6-1 / 2 / 3 / 4		
	EN 60079-0 / 11 / 26		
	EN 61241-0 / 11		
	EN 50303		
Vibration resistance to	≤ 20 g		
DIN EN 60068-2-6 at 10 500 Hz			
Protection class to IEC 60529	IP 67		
	(M12x1, when an IP 67 con	nector is used)	
Relevant data for Ex applications			
Ourselitere			
Supply voltage	1428 V DC		
Compensated temperature range	16: -4+140°F		
	10, 144+108 F		
Operating temperature range	Te: 4 140°E		
Operating temperature range	104+140 F T5 T4: 4 +159°E		
	T100 4 ±158°E		
Max ambient temperature T	T6: ±140°E	T100: ±158°E	
	T0. + 140 T	1100. 1138 1	
Max input ourrent	100 mA	02 mA	
Max input power		0.65 W	
Max. informal consoitance	22 pE	22 pE	
Max. internal inductors			
	<u>UIIII</u>		
Insulation voltage ?	protoction EN 61000 6.2	ervollage	
Approved intrinsic safety barriers	Pepperl & Euche: 7	797	
Approved intrinsic safety barriers	Telematic Ex STOCK: M	707 TI 7087	
Other data	IGIGINALIC LA STOCK. IVI		
Desidual ripple of supply yeltage	- E 9/		
	≤ 0.70		
Life expectancy			
Weight	~ 150 g		
and short circuit protection are provided	I. FS (Full Scale) = relative to compl	ete measuring range	

Setting options:

In conjunction with the HYDAC Programming Unit HPG 3000, all the settings are combined in an easy-to-follow menu.

Setting ranges for the switch outputs:

Measuring range in psia	Increment in psia
015	0.002 to 0.05
02.5	0.005 to 0.05

The switch point (upper switch value) on all instruments is between 5 % and 100 % of the measuring range and the switch-back point (lower switch value) is between 1 % and 96 % of the measuring range.

	Minimum value in ms	Maximum value in ms
Switch-on delay Ton1/Ton2	8	2040
Switch-off delay ToF1/ToF2	8	2040

The increment for all instruments is 8 ms.

Pin connections:





6	2	

Pin	Process connection	HPG connection
1	+U _B	+U _B
2	0 V	Comport 1 *
3	0 V	0 V
4	Out 1	n.c.
5	0 V	Comport 2 *
* Comport = programming connection		

Areas of application:

Code No. for use in Model code	1	2	3	8
Protection Type	I M1 Ex ia I	II 1G Ex ia IIC T4, T5, T6	II 2G Ex ia IIC II 1/2G Ex ia IIC T4, T5, T6	Ⅱ 1D Ex iaD 20 T100 °C
Certificate	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X	DEKRA EXAM BVS 07 ATEX E 041 X
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II Category 1G Gases Protection class: intrinsically safe ia with barrier For use in Zone 0 T4, T5: $T_a = 70 \degree C$ T6: $T_a = 60 \degree C$	Group II Category 2G, 1/2G Gases Protection class: intrinsically safe ia with barrier For use in Zone 1, 2 For mounting to Zone 0 T4, T5: $T_a = 70$ °C T6: $T_a = 60$ °C	Group II Category iD Dusts Protection class: intrinsically safe ia with barrier For use in Zone 20, 21, 22 For mounting to Zone 20 T100: T _a = 70 °C
Electrical Connection	8	8	8	8

Instruments for other Protection types and applications are available on request. Please contact our technical sales department for more information.

Model code:

Model code.
EDS 4 1 X 8 - $XXXX - X - AXX - 000 - X1(PSI)$
Mechanical connection 8 = 1/4-18 NPT, male Other connections upon request
Electrical connection 8 = Male M12x1, 5 pole (connector not supplied)
Pressure ranges in psia 0015, 0050 psia
Switching output P = Programmable
Approval A = ATEX
Insulation voltage N = 50 V AC
Protection types and applications (code) 1 = I M1 Ex ia I 2 = II 1G Ex ia IIC T4, T5, T6 3 = II 2G Ex ia IIC T4, T5, T6 / II 1/2G Ex ia IIC T4, T5, T6 8 = II 1D Ex iaD 20 T100 °C
Modification number
Seal material (in contact with fluid) F = FPM seal (e.g.: for hydraulic oils) E = EPDM seal (e.g.: for refrigerants)

Material of connection (in contact with fluid)

1 = Stainless steel

Accessories:

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

Safety instructions:

- These units must only be programmed outside the potentially explosive location.
- When operating in potentially explosive locations, the programming cables may only be connected to the 0 V outside of the potentially explosive area.
- The switching output draws the switching energy from the power supply to the pressure switch. No additional energy is introduced into the electrical circuit through the switching output.
- Dual Zener barriers specified and approved in the technical data must be used to connect the pressure switch. These have a reverse polarity diode to decouple the signal. The signal path may only be passively loaded.
- Ensure that measured fluids in contact with the pressure switch are compatible with the materials used.

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog

Dimensions:



Programming Unit:

(must be ordered separately)

HPG 3000 - 000 Portable Programming Unit Part. No. 909 422

HPG 3000 Power Supply with connector: Part No. 02091103



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25.2

M12x1

Caution:

The HPG 3000 Programming Unit may only be used outside the potentially explosive area.

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

HYDAC 40

US 18.341.2/10.17

YDAC INTERNATIONAL



Description:

The pressure transmitter HDA 4700 in CSA version has been specially developed for the North American market for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4700 in CSA version has a stainless steel measurement cell with thin-film strain gauge.

Intended areas of application are, for example, the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Protection types and applications:

Intrinsically safe:

 Class I Div. 1 Group A, B, C, D T Class I Zone 0 AEx ia IIC T6 Ex ia IIC T6 	6 [C, US] [US] [C]
- Class I, II, III Div. 1 Group A, B, C, D, E, F, G T6	[C, US]
Non incendive: - Class I Div. 2 Group A, B, C, D T - Class I Zone 2 AEx nL IIC T4 - Class I Zone 2 Ex nL IIC T4	4A[C, US] [US] [C]
- Class I, II, III Div. 2 Group A, B, C, D, F, G T4A - Class I Zone 2 AEx nA II T4 - Class I Zone 2 Ex nA II T4	[C, US] [US] [C]

Special features:

- Accuracy $\leq \pm 0.25$ % FS B.F.S.L.
- Certificate: CSA 1760344
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4700 CSA Intrinsically safe **CSA** Non Incendive

Technical data:

Input data	
Measuring ranges ¹⁾²⁾	150, 500, 750, 1000, 1500, 3000, 5000, 6000, 9000, 15000 psi
Overload pressures	290, 1160, 1740, 2900, 2900, 7250, 11600, 11600, 14500, 23200 psi
Burst pressures	1450, 2900, 4350, 7250, 7250, 14500, 29000, 29000, 29000, 43500 psi
Mechanical connection ²⁾	SAE 6 9/16-18 UNF 2A SE 250 CS20, Autoclave (7/16-20-UNE 2B)
Torque value	15lb-ft(20Nm) - SAE 6
	30lb-ft(40Nm) SF 250 CX20
Parts in contact with medium	Stainless steel: 1.4542; 1.4571; 1.4435; 1.4404; 1.4301
Output data	Seal. FPM
Output signal	4 20 mA 2 conductor
permitted load resistance	$R_{Imax} = (U_{R} - 12 \text{ V}) / 20 \text{ mA} [k_{\Omega}]$
Accuracy to DIN 16086	<pre>< ± 0.25 % FS typ.</pre>
Max. setting	≤ ± 0.5 % FS max.
Accuracy at min. setting (B.F.S.L.)	≤ ± 0.15 % FS typ. ≤ ± 0.25 % FS max.
Temperature compensation	≤ ± 0.0045% FS/°F typ.
Zero point	≤ ± 0.0085% FS/°F max.
Temperature compensation	≤ ± 0.0045% FS/°F typ.
Over range	$\leq \pm 0.0085\%$ FS/F max.
to DIN 16086	≤ ± 0.3 % FS max.
Hysteresis	≤ ± 0.1 % FS max.
Repeatability	≤±0.05 % FS
Rise time	≤ 1.5 ms
Long-term drift	≤ ± 0.1 % FS typ. / year
Environmental conditions	
Compensated temperature range	Intrinsically sate: -4+140°F Non incendive: 4+185°F
Operating temperature range ³⁾	Intrinsically safe: -40+140°F/ -4+140°F Non incendive: -40+185°F/ -4+185°F
Storage temperature range	-40 to 212°F
Fluid temperature range ³⁾	Intrinsically safe: -40+140°F / -4+140°F Non incendive: -40+185°F / -4+185°F
🕮 mark	Certificate No.: CSA 1760344
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g
Protection class to IEC 60529 / NEMA	Min. IP 65
(depending on the electr. connection)	Min. NEMA 4
Relevant data for Ex applications	
Supply voltage	12 28 V DC
Max. input current	100 mA
Max. Input power	up to 28 V: 1 W
Connection capacitance of the sensor	
	50 V AC with integrated even eltage
Insulation voltage	protection EN 61000-6-2
Other data	
Residual ripple of supply voltage	≤ 5 %
Life expectancy	> 10 million cycles
	0 100 % FS
Weight	~ 150 g
Note: Reverse polarity protection of the short circuit protection are prov	he supply voltage, excess voltage, override and ided.
B.F.S.L. = B est Fit Straight Line	npiere measuring range
1) Bar pressure ranges on Europe	an datasheet

²⁾ 15000 psi only with mechanical connection SF 250 CX20, Autoclave
 ³⁾ -4°F with FPM seal, -40°F on request
 ⁴⁾ 500 V AC on request

Pin connections:

Conduit (single cores)



Core	HDA 47X9-A
green	Signal +
white	Signal -
green- yellow	Housing

EN175301-803 (DIN 43650)



Pin	HDA 47X5-A	HDA 47XA-A
1	Signal +	Signal +
2	Signal -	Signal -
3	n.c.	n.c.
1	Housing	Housing

Group	1	2	3	4
Protection Type	Intrinsically safe	Intrinsically safe	Non incendive (with field cabling)	Non incendive
	Gases and dusts	Gases	Gases	Gases and dusts
Certificate	CSA 1760344			
	Intrinsically safe	Intrinsically safe	Non incendive	Non incendive
Zones / Categories	- Class I, II, III - Division 1 - Group A, B, C, D, E, F, G T6	Ex ia IIC T6 - Class I - Zone 0 - AEx ia IIC T6 - Class I - Division I - Group A, B, C, D T6	- Class I - Division 2 - Group A, B, C, D T4A - Class I - Zone 2 - AEx nL IIC T4 - Class I - Zone 2 - Zone 2 - Ex nL IIC T4	 Class I, II, III Division 2 Group A, B, C, D, F, G T4A Class I Zone 2 Ex nA II T4 Class I Zone 2 A nA II T4
Electrical Connection	9, A	5, 9, A	5, 9, A	9
Code for Model Code	A		В	С

Model code:
HDA 4 7 X X – A – <u>XXXX</u> – C X X – <u>000</u> (PSI) (<u>48 incl</u>
Mechanical connection 7 = SAE 6, 9/16-18 UNF 2A male 8 = 1/4-18 NPT C = SF 250 CX20, Autoclave (only for "15000 psi"
press. range) Electrical connection 5 = Male, 3 pole + PE, EN175301-803 (DIN 43650) (connector supplied)
9 = Conduit connection thread (1/2-14 NPT, male) A = Male, EN175301-803 (DIN 43650), 3 pole + PE (1/2" conduit famale thread)
Signal A = 4 20 mA, 2 conductor Pressure ranges in psi
Approval C = CSA Insulation voltage N = 50 V AC
Protection types and applications (code) A = Group 1 B = Group 2 and 3 C = Group 4
Modification number 000 = Standard Cable length in inches (only for electr. connection type 9) Standard = 48 inches
Accessories: Appropriate accessories, such as electrical connectors can be found in the Accessories brochure



Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog.

HYDAC 44

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

YDAC INTERNATIONAL



Description:

The pressure transmitter HDA 4400 in CSA version has been specially developed for the North American market for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4400 in CSA version has a stainless steel measurement cell with thin-film strain gauge.

Intended areas of application are, for example, the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Protection types and applications:

Intrinsically safe:

- Class I Div. 1 Group A, B, C, D T6 - Class I Zone 0 AEx ia IIC T6 - Ex ia IIC T6	[C, US] [US] [C]
- Class I, II, III Div. 1 Group A, B, C, D, E, F, G T6	[C, US]
<i>Non incendive:</i> - Class I Div. 2 Group A, B, C, D T4A - Class I Zone 2 AEx nL IIC T4 - Class I Zone 2 Ex nL IIC T4	[C, US] [US] [C]
- Class I, II, III Div. 2 Group A, B, C, D, F, G T4A - Class I Zone 2 AEx nA II T4 - Class I Zone 2 Ex nA II T4	[C, US] [US] [C]

Special features:

- Accuracy $\leq \pm 0.5$ % FS B.F.S.L.
- Certificate: CSA 1760344
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4400 CSA Intrinsically safe CSA Non Incendive



Technical data:

Input data		
Measuring ranges ¹⁾	150, 500, 750, 1000, 1500, 3000, 5000, 6000, 9000, 15000 psi	
Overload pressures	290, 1160, 1740, 2900, 2900, 7250, 11600, 11600, 14500, 23200 psi	
Burst pressures	1450, 2900, 4350, 7250, 7250, 14500, 29000, 29000, 29000, 43500 psi	
Mechanical connection ¹⁾	SAE 6 9/16-18 UNF 2A SE 250 CS20. Autoclave(7/16-20-LINE 2B)	
Torque value	15lb-ft(20Nm) - SAE 6	
	30lb-ft(40Nm) SF 250 CX20	
Parts in contact with medium ²⁾	Stainless steel: 1.4542; 1.4571; 1.4435; 1.4404; 1.4301	
	Seal: FPM	
Output data		
Output signal, permitted load resistance	4 20 mA, 2 conductor R _{Lmax} = (U _B - 12 V) / 20 mA [kΩ]	
Accuracy to DIN 16086, Max. setting	≤ ± 0.5 % FS typ. ≤ ± 1 % FS max.	
Accuracy at min. setting (B.F.S.L.)	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.	
Temperature compensation	≤ ± 0.0085% FS/°F tvp.	
Zero point	≤ ± 0.014% FS/°F max.	
Temperature compensation Over range	≤ ± 0.0085% FS/°F typ. ≤ ± 0.014% FS/°F max.	
Non-linearity at max. setting to DIN 16086	≤ ± 0.3 % FS max.	
Hysteresis	≤ ± 0.4 % FS max.	
Repeatability	≤ ± 0.1 % FS	
Rise time	≤ 1.5 ms	
Long-term drift	± 0.3 % FS typ. / year	
Environmental conditions		
Compensated temperature range	Intrinsically safe: -4 +140°F	
	Non incendive: -4+185°F	
Operating temperature range	Intrinsically safe: -4+140°F Non incendive: -4+185°F	
Storage temperature range	-40 to 212°F	
Fluid temperature range ³⁾	Intrinsically safe: -40+140°F / -4+140°F Non incendive: -40+185°F / -4+185°F	
🗶 mark	Certificate No.: CSA 1760344	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g	
Protection class to IEC 60529 / NEMA (depending on the electr. connection)	Min. IP 65 Min. NEMA 4	
Relevant data for Ex applications		
Supply voltage	12 28 V DC	
Max. input current	100 mA	
Max. input power	up to 28 V: 1 W	
Connection capacitance of the sensor	≤ 22 nF	
Inductance of the sensor	0 mH	
Insulation voltage 4)	50 V AC, with integrated overvoltage protection EN 61000-6-2	
Other data		
Residual ripple of supply voltage	≤ 5 %	
Life expectancy	> 10 million cycles 0 100 % FS	
Weight	~ 150 g	
 Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided. FS (Full Scale) = relative to complete measuring range, B.F.S.L.= Best Fit Straight Line ¹⁾ 15000 psi only with mechanical connection SF 250 CX20, Autoclave ²⁾ Other seal materials available on request ³⁾ 4°F with FPM seal, -40°F on request ⁴⁾ 500 V AC on request		

Pin connections:

Conduit (single cores)



Core	HDA 44X9-A
green	Signal +
white	Signal -
green- yellow	Housing

EN175301-803 (DIN 43650)



Pin	HDA 44X5-A	HDA 44XA-A
1	Signal +	Signal +
2	Signal -	Signal -
3	n.c.	n.c.
T	Housing	Housing

Group	1	2	3	4
Protection Type	Intrinsically safe	Intrinsically safe	Non incendive (with field cabling)	Non incendive
	Gases and dusts	Gases	Gases	Gases and dusts
Certificate	CSA 1760344			
	Intrinsically safe	Intrinsically safe	Non incendive	Non incendive
Zones / Categories	- Class I, II, III - Division 1 - Group A, B, C, D, E, F, G T6	Ex ia IIC T6 - Class I - Zone 0 - AEx ia IIC T6 - Class I - Division I - Group A, B, C, D T6	 Class I Division 2 Group A, B, C, D T4A Class I Zone 2 AEx nL IIC T4 Class I Zone 2 AEx nL IIC T4 	 Class I, II, III Division 2 Group A, B, C, D, F, G T4A Class I Zone 2 Ex nA II T4 Class I Zone 2 A and II T4 IP 6x
Electrical Connection	9, A	5, 9, A	5, 9, A	9
Code for Model Code	A		В	С

Model code:
HDA 4 4 X X – A – <u>XXXX</u> – C X X – <u>000</u> (PSI) (<u>48in</u>)
Model code: HDA 4 4 X X – A – XXXX – C X X – 000 (PSI) (48in) Mechanical connection
Modification number 000 = Standard Cable length in inches (only for electr. connection code 9) Standard = 48 inches
Accessories: Appropriate accessories, such as electrical connectors can be found in the Accessories brochure.

electrical connector with 1/2 NPT connection



Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For European mechanical connection and bar ranges see European Catalog

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HYDAC ELECTRONICS

90 Southland Dr. Bethlehem, PA 18017

Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com

Website: www.hydacusa.com

HYDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4300 in **CSA** version has been specially developed for the North American market for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4300 in **CSA** version has a ceramic measurement cell with thick-film strain gauge for measuring relative pressure in the low pressure range.

Intended areas of application are, for example, the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Protection types and applications: *Intrinsically safe:*

 Class I Div. 1 Group A, B, C, D T6 Class I Zone 0 AEx ia IIC T6 Ex ia IIC T6 	[C, US] [US] [C]
- Class I, II, III Div. 1 Group A, B, C, D, E, F, G T6	[C, US]
Non incendive: - Class I Div. 2 Group A, B, C, D T4A - Class I Zone 2 AEx nL IIC T4 - Class I Zone 2 Ex nL IIC T4	[C, US] [US] [C]
 Class I, II, III Div. 2 Group A, B, C, D, F, G T4A Class I Zone 2 AEx nA II T4 Class I Zone 2 Ex nA II T4 	[C, US] [US] [C]

Special features:

- Accuracy $\leq \pm 0.5$ % FS B.F.S.L.
- Certificate: CSA 1760344
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4300 CSA Intrinsically safe CSA Non Incendive



| Technical data:

Input data Measuring ranges ¹⁾ Overload pressures	15, 30, 50, 100, 150, 250, 500 psi	
Measuring ranges ¹⁾ Overload pressures	15, 30, 50, 100, 150, 250, 500 psi	
Overload pressures		
01011044 010004100	45, 100, 150, 290, 450, 725, 1500 psi	
Burst pressures	70, 150, 250, 400, 650, 1000, 2500 psi	
Mechanical connection	1/4-18 NPT male	
Torque value	30 ft-lb (40 Nm)	
Parts in contact with medium	Sensor: Ceramic Al203	
	Mech. conn.: 1.4301	
	Seal: FPM / EPDM	
Output data		
Output signal, permitted load resistance	4 20 mA, 2 conductor R _{Lmax} = (U _B - 12 V) / 20 mA [kΩ]	
Accuracy to DIN 16086, Max. setting	≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.	
Accuracy at min. setting	≤ ± 0.25 % FS typ.	
(B.F.S.L.)	≤ ± 0.5 % FS max.	
Temperature compensation	≤ ± 0.012% FS/°F typ.	
Zero point	≤ ± 0.017% FS/°F max.	
Temperature compensation	≤ ± 0.012% FS/°F typ.	
Over range	≤ ± 0.017% FS/°F max.	
Non-linearity at max. setting to DIN 16086	≤±0.5%FS max.	
Hysteresis	≤ ± 0.4 % FS max.	
Repeatability	≤ ± 0.1 % FS	
Rise time	≤ 1.5 ms	
Long-term drift	≤ ± 0.3 % FS typ. / year	
Environmental conditions		
Compensated temperature range	Intrinsically safe: -4+140°F Non incendive: -4+185°F	
Operating temperature range	Intrinsically safe: -4+140°F Non incendive: -4+185°F	
Storage temperature range	-40 to 212°F	
Fluid temperature range ²⁾	Intrinsically safe: -40+140°F / -4+140°F Non incendive: -40+185°F / -4+185°F	
St. mark	Certificate No : CSA 1760344	
Vibration resistance to	< 20 g	
DIN EN 60068-2-6 at 10 500 Hz	s 20 g	
Protection class to IEC 60529 / NEMA	Min IP 65	
(depending on the electr. connection)	Min. NEMA 4	
Relevant data for Ex applications		
Supply voltage	12 28 V DC	
Max. input current	100 mA	
Max. input power	up to 28 V: 1 W	
Connection capacitance of the sensor	≤ 22 nF	
Inductance of the sensor	0 mH	
Insulation voltage 3)	50 V AC, with integrated overvoltage	
	protection EN 61000-6-2	
Other data		
Residual ripple of supply voltage	≤ 5 %	
Life expectancy	> 10 million cycles	
	0 100 % FS	
Weight	~ 180 g	
 Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided. FS (Full Scale) = relative to complete measuring range B.F.S.L.= Best Fit Straight Line ¹⁾ For bar ranges see European catalog ²⁾ -4°F with FPM or EPDM seal, -40°F on request ³⁾ 500 V AC on request 		

JS 18.343.2/10.17

Pin connections:

Conduit (single cores)



Core	HDA 43X9-A
green	Signal +
white	Signal -
green- yellow	Housing

EN175301-803 (DIN 43650)



Pin	HDA 43X5-A	HDA 43XA-A
1	Signal +	Signal +
2	Signal -	Signal -
3	n.c.	n.c.
\perp	Housing	Housing

Group	1	2	3	4		
Protection Type	Intrinsically safe Gases and dusts	Intrinsically safe	Non incendive (with field cabling) Gases	Non incendive		
Certificate	CSA 1760344					
	Intrinsically safe	Intrinsically safe	Non incendive	Non incendive		
Zones / Categories	- Class I, II, III - Division 1 - Group A, B, C, D, E, F, G T6	Ex ia IIC T6 - Class I - Zone 0 - AEx ia IIC T6 - Class I - Division I - Group A, B, C, D T6	- Class I - Division 2 - Group A, B, C, D T4A - Class I - Zone 2 - AEx nL IIC T4 - Class I - Class I - Zone 2	- Class I, II, III - Division 2 - Group A, B, C, D, F, G T4A - Class I - Zone 2 - Ex nA II T4 - Class I - Zone 2		
Electrical Connection	9, A	5, 9, A	5, 9, A	9		
Code for Model Code	A	B		С		

Model code:

HDA 4 3 8 $X - A - XXXX - C X X - XXX - X 1(PSI) (48in)$
Mechanical connection $8 = 1/4^{a}$ -18 NPT maleElectrical connection $5 = Male, 3 \text{ pole+ PE},$ EN175301-803 (DIN 43650) (connector supplied) $9 = \text{Conduit connection thread}$ (1/2-14 NPT, male) $A = Male, \text{EN175301-803}$ (DIN 43650), 3 pole + PE (d/2) executive formula (breach)
Signal
$A = 4 \dots 20 \text{ mA}, 2 \text{ conductor}$
Pressure ranges in psi
0015, 0030, 0050, 0100, 0250, 0500
Insulation voltage
N = 50 V AC
Protection types and applications (code) A = Group 1 B = Group 2 and 3 C = Group 4
Modification number
000 = Standard
F = FPM seal (e.g.: for hydraulic oils) E = EPDM seal (e.g.: for refrigerants)
Material of connection (in contact with fluid)
Cable length in inches (only for electr. connection type 9) Standard = 48 inches
Accessories: Appropriate accessories, such as electrical connectors can be found

Appropriate accessories, such as electrical connectors can be found in the Accessories brochure.



Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS

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GYDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4100 in CSA version has been specially developed for the North American market for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industry model, the HDA 4100 in CSA version has a ceramic measurement cell with thickfilm strain gauge for measuring absolute pressure in the low pressure range.

Intended areas of application are, for example, the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Protection types and applications: *Intrinsically safe:*

- Class I Div. 1 Group A, B, C, D T6 - Class I Zone 0 AEx ia IIC T6 - Ex ia IIC T6	[C, US] [US] [C]
- Class I, II, III Div. 1 Group A, B, C, D, E, F, G T6	[C, US]
Non incendive: - Class I Div. 2 Group A, B, C, D T4A - Class I Zone 2 AEx nL IIC T4 - Class I Zone 2 Ex nL IIC T4	[C, US] [US] [C]
 Class I, II, III Div. 2 Group A, B, C, D, F, G T4A Class I Zone 2 AEx nA II T4 Class I Zone 2 Ex nA II T4 	[C, US] [US] [C]

Special features:

- Accuracy $\leq \pm 0.5$ % FS B.F.S.L.
- Certificate: CSA 1760344
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Absolute Pressure Transmitter HDA 4100 CSA Intrinsically safe CSA Non Incendive



Technical data:

Input data			
Measuring ranges	15, 50 psia		
Overload pressures	40, 150 psia		
Burst pressures	70, 250 psia		
Mechanical connection	1/4-18 NPT male		
Torque value	30 ft-lb (40 Nm)		
Parts in contact with medium	Sensor: Ceramic Al203		
	Mech. conn.: 1.4301		
	Seal: FPM / EPDM		
Output data			
Output signal, permitted load resistance	420 mA, 2 conductor R _{Lmax} = (U _B - 12 V) / 20 mA [kΩ]		
Accuracy to DIN 16086 Max. setting	≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.		
Accuracy at min. setting	$\leq + 0.25$ % FS typ.		
(B.F.S.L.)	≤ ± 0.5 % FS max.		
Temperature compensation	≤ ± 0.012% FS/°F tvp.		
Zero point	≤ ± 0.017% FS/°F max.		
Temperature compensation	≤ ± 0.012% FS/°F typ.		
Over range	≤ ± 0.017% FS/°F max.		
Non-linearity at max. setting to DIN 16086	≤ ± 0.5 % FS max.		
Hysteresis	≤ ± 0.4 % FS max.		
Repeatability	≤±0.1 % FS		
Rise time	≤ 1.5 ms		
Long-term drift	≤ ± 0.3 % FS typ. / year		
Environmental conditions			
Compensated temperature range	Intrinsically safe: -4+140°F		
	Non incendive: -4+185°F		
Operating temperature range	Intrinsically safe: -4+140°F Non incendive: -4+185°F		
Storage temperature range	-40 to 212°F		
Fluid temperature range ¹⁾	Intrinsically safe: -40+140°F / -4+140°F		
· · ·	Non incendive: -40+185°F / -4+185°F		
🐠 " mark	Certificate No.: CSA 1760344		
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g		
Protection class to IEC 60529 / NEMA	Min JP 65		
(depending on the electr. connection)	Min. NEMA 4		
Relevant data for Ex applications			
Supply voltage	12 28 V DC		
Max. input current	100 mA		
Max. input power	up to 28 V: 1 W		
Connection capacitance of the sensor	≤ 22 nF		
Inductance of the sensor	0 mH		
Insulation voltage ²⁾	50 V AC, with integrated overvoltage		
	protection EN 61000-6-2		
Other data			
Residual ripple of supply voltage	≤ 5 %		
Life expectancy	> 10 million cycles 0 100 % FS		
Weight	~ 180 g		
Note: Reverse polarity protection of the supply y	oltage, excess voltage, override and short circuit		
 For the second se	asuring range request		

Pin connections:

Conduit (single cores)



Core	HDA 41X9-A
green	Signal +
white	Signal -
green- yellow	Housing

EN175301-803 (DIN 43650)



Pin	HDA 41X5-A	HDA 41XA-A
1	Signal +	Signal +
2	Signal -	Signal -
3	n.c.	n.c.
1	Housing	Housing

Group	1	2	3	4
Protection Type	Intrinsically safe	Intrinsically safe	Non incendive (with field cabling)	Non incendive
	Gases and dusts	Gases	Gases	Gases and dusts
Certificate		CSA 17	760344	
	Intrinsically safe	Intrinsically safe	Non incendive	Non incendive
Zones / Categories	- Class I, II, III - Division 1 - Group A, B, C, D, E, F, G T6	Ex ia IIC T6 - Class I - Zone 0 - AEx ia IIC T6 - Class I - Division I - Group A, B, C, D T6	 Class I Division 2 Group A, B, C, D T4A Class I Zone 2 AEx nL IIC T4 Class I Zone 2 AEx nL IIC T4 	 Class I, II, III Division 2 Group A, B, C, D, F, G T4A Class I Zone 2 Ex nA II T4 Class I Zone 2 A nA II T4
Electrical Connection	9, A	5, 9, A	5, 9, A	9
Code for Model Code	A	В		С

Model code:

HDA 4 1 X X – A – <u>XXXX</u> – C X X – <u>000</u> – X 1 (PSI) (<u>48in)</u>
Mechanical connection 8 = 1/4-18 NPT male Electrical connection 5 = Male, 3 pole+ PE, EN175301-803 (DIN 43650) (connector supplied) 9 = Conduit connection thread (1/2-14 NPT, male) A = Male EN175301-803 (DIN 43650), 3 pole + PE (1/2" conduit female thread)
Signal
Pressure ranges in psi 0015, 0050 Approval
C = CSA
Insulation voltage
Protection types and applications (code) A = Group 1 B = Group 2 and 3 C = Group 4
Modification number
Seal material (in contact with fluid) F = FPM seal (e.g.: for hydraulic oils) E = EPDM seal (e.g.: for refrigerants)
Material of connection (in contact with fluid)
Cable length in inches (only for electr. connection type 9) Standard = 48 inches
Accessories:

Appropriate accessories, such as electrical connectors can be found in the Accessories brochure.





Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com 12

HYDAC 56



Description:

The pressure transmitter HDA 4700 IECEx Intrinsically Safe version has been especially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version of the HDA 4700, devices with IECEx Intrinsically Safe approval have a field-proven, all-welded stainless steel measurement cell with thin film strain gauge without internal seal.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high dust loads, e.g. in mills.

Protection types and applications:

Ex ia I Ma

Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex nA IIC T6, T5, T4 Gc Ex ic IIC T6, T5, T4 Gc

Ex ta IIIC T80/90/100 °C Da T₅₀₀ 90/100/110 °C Da Ex tb IIIC T80/90/100 °C Db Ex tc IIIC T80/90/100 °C Dc Ex ic IIIC T80/90/100 °C Dc Ex ia IIIC T85 °C Da

Special features:

- Accuracy $\leq \pm 0.25$ % FS B.F.S.L.
- Certificate: IECEx TSA 09.0041X / IECEx KEM 08.0014X
- Output signal 4 .. 20 mA
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Electronic **Pressure Transmitter** HDA 4700 **IECEx Intrinsically Safe IECEx Dustproof Enclosure IECEx Non-sparking**



Technical data:

Input data	
Measuring ranges ¹⁾	150, 500, 750, 1000, 1500, 3000, 5000, 6000, 9000,
	15000 psi
Overload pressures	290, 1160, 1740, 2900, 2900, 7250, 11600, 11600, 14500, 23200 psi
Burst pressure	1450, 2900, 4350, 7250, 7250, 14500, 29000, 29000, 29000, 29000, 43500 psi
Mechanical connection ¹⁾	SAE 6 9/16-18 UNF 2A SF 250 CS20, Autoclave(7/16-20-UNF 2B)
Torque value	15lb-ft(20Nm) - SAE 6 30lb ft(40Nm) SE 250 CX20
Parts in contact with medium	Stainl. steel: 1.4542; 1.4571; 1.4435;
	Seal: FPM
Output data	
Output signal, permitted load resistance	4 20 mA, 2 conductor R _{Lmax} = (U _B - 12 V) / 20 mA [kΩ]
Accuracy to DIN 16086, Max. setting	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.
Accuracy at min. setting	≤ ± 0.15 % FS typ.
(B.F.S.L.)	≤ ± 0.3 % FS max.
Iemperature compensation Zero point	≤ ± 0.0045% FS/°F typ. ≤ ± 0.0085% FS/°F max.
Temperature compensation	≤ ± 0.0045% FS/°F typ. ≤ ± 0.0085% FS/°F max.
Non-linearity at max. setting to DIN 16086	≤ ± 0.3 % FS max.
Hysteresis	≤ ± 0.1 % FS max.
Repeatability	≤ ± 0.05 % FS
Rise time	≤ 1.5 ms
Long-term drift	≤ ± 0.1 % FS typ. / year
Environmental conditions	
Compensated temperature range	-4+185°F
Operating temperature range ²⁾	-40+140°F/ -4+140°F
Storage temperature range	-40+212°F
Fluid temperature range ²⁾	-40+140°F/ -4+140°F
CEmark	EN 61000-6-1 / 2 / 3 / 4; EN 60079-0 / 11 / 26 / 36
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g
Protection class to IEC 60529	IP 65 (for male EN175301-803 (DIN 43650) and Binder 714 M18) IP 67 (for M12x1 male, when an
	IP 67 female connector is used)
Relevant data for Ex applications	Ex ia, ic Ex nA, ta, tb, tc
Supply voltage	UI = 1228 V 1228 V
Max. input current Max. input power	Pi = 1 W max. power consuption
Connection capacitance of the sensor	$C_i = \leq 22 \text{ nF}$
Inductance of the sensor	$L_i = 0 \text{ mH}$
Insulation voltage 3)	50 V AC, with integrated overvoltage protection EN 61000-6-2
Other data	- 0/
Residual ripple of supply voltage	<u>≤ 5 %</u>
Life expectancy	> 10 million cycles 0 100 % ES
Weight	~ 150 g
Note: Reverse polarity protection of the supply v override and short circuit protection are pro FS (Full Scale) = relative to the full measure	Ditage, excess voltage, vided. ring range, B.F.S.L.= Best Fit Straight Line
 ¹ 15000 psi only with mechanical connection ²⁾ -4°F with FPM seal, -40°F on request ³⁾ 500 V AC on request 	on SF 250 CX20, Autoclave

3) 500 V AC on request

Areas of application:

Prote	ction type and lications	S	Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da Ex tb IIIC T80 °C Db	Ex ic IIC T6 Gc Ex ic IIIC T80 °C Dc	Ex ia IIIC T85 °C Da
Z Ca	cones / tegories		Equipment protec- tion level Ma Mining Protection class: intrinsically safe ia with barrier	Equipment protection level Ga, Ga/Gb Gases Protection class: intrinsically safe ia with barrier	Equipment protection level Gb Gases Protection class: intrinsically safe ia with barrier	Equipment protection level Gc Gases Protection class: non-sparking nA	Equipment protection level Da, Db Conductive dust Protection class: Dustproof enclosure	Equipment protection level Gc, Dc Gases/conductive dust Protection class: Intrinsically safe ic with barrier	Equipment protection level Da Conductive dust Protection class: intrinsically safe ia with barrier
Electric	al connect	tion	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4, 5, 6	4, 5, 6
Code for use in Model code	IECEx	IECEx Australia							
1	✓	✓	✓	 ✓ 	✓				
9	✓					✓			
А	 Image: A second s						✓		
С	 Image: A second s							~	
D	 Image: A second s		✓	✓	✓				✓

Certificate numbers: IECEx TSA 09.0041X, IECEx KEM 08.0014X

Devices in the ignition protection class "Dustproof enclosure" for the protection types Ex ta IIIC T80/90/100 °C Da T500T90/T100/T110°C Da, Ex tb IIIC T80/90/100 °C Db and Ex tc IIIC T80/90/100 °C Dc are available with flying leads on request. Devices in the ignition protection class "non-sparking" for protection type Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Model code:

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HDA 4 7 X X – A – <u>XXXX</u> – I X X – <u>000</u> (PS	I)
Mechanical connection	
7 = SAE 6, 9/16-18 UNF 2A male	
C = SF 250 CX20, Autoclave (only for "15000 psi" press. range)	
Electrical connection	
4 = Male 4 pole Binder series 714 M18 (connector not supplied) 5 = Male 3 pole + PE, EN175301-803 (DIN 43650) (connector supplied) 6 = Male M12x1, 4 pole (connector not supplied)	
Signal	
A = 4 20 mA, 2 conductor	
Pressure ranges in psi	
0500, 0750, 1000, 1500, 3000, 5000, 6000, 9000	
15000 psi (only in conjunction with mechanical connection type °C)	
Approval	
N = 50 V AC	
Protection types and applications (code)	
1 = Ex ia I Ma	
Ex ia IIC T6 Ga	
Ex ia IIC 16 Ga/Gb	
EX Id IIC TO GD	
9 = Ex hA HC TO GC (only in conjunction with electr. connection 6)"	
A = Ex ta IIIC 180 °C 1500 190 °C Da (only in conjunction with electr. connection "6")*Ex tb IIIC T80 °C Db	
C = Exic IIC T6 Gc	
D = Exial Ma Exia IIC T6 Ga	
Ex ia IIC T6 Ga/Gb	
Ex ia IIC T6 Gb	
Ex ia IIIC T85 °C Da	
Modification number	
000 = Standard	

Notes:

* For design and electrical connection see Dimensions

Accessories:

Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.

Pin connections:



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection, e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part No. 6098243

Ø**27**

Note:

The information in this brochure relates to

the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

HYDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4400 IECEx Intrinsically Safe version has been especially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version of the HDA 4400, devices with IECEx Intrinsically Safe approval have a field-proven, all-welded stainless steel measurement cell with thin film strain gauge without internal seal.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high dust loads, e.g. in mills.

Protection types and applications:

Ex ia I Ma

Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex nA IIC T6,T5,T4 Gc Ex ic IIC T6,T5,T4 Gc

Ex ta IIIC T80/90/100 °C Da T₅₀₀ 90/100/110 °C Da Ex tb IIIC T80/90/100 °C Db Ex tc IIIC T80/90/100 °C Dc Ex ic IIIC T80/90/100 °C Dc Ex ia IIIC T85 °C Da

Special features:

- Accuracy: ≤ ± 0.5 % FS B.F.S.L.
- Certificate: IECEx TSA 09.0041X / IECEx KEM 08.0014X
- Output signal 4 .. 20 mA
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Electronic Pressure Transmitter HDA 4400

IECEx Intrinsically Safe IECEx Dustproof Enclosure IECEx Non-sparking



Technical data:

Input data			
Measuring ranges ¹⁾	150, 500, 750, 1000, 1500 9000, 15000 psi	0, 3000, 5000, 6000,	
Overload ranges	290, 1160, 1740, 2900, 2900, 7250, 11600, 11600, 14500, 23200 psi		
Burst pressure	1450, 2900, 4350, 7250, 7250, 14500, 29000, 29000, 43500 psi		
Mechanical connection ¹⁾	SAE 6 9/16-18 UNF 2A SF 250 CS20, Autoclave(7/16-20-UNF 2B)	
Torque value	15lb-ft(20Nm) - SAE 6 30lb-ft(40Nm) SE 250 CX	20	
Parts in contact with medium	Stainless steel: 1.4542; 1.4571; 1.4435; 1.4404; 1.4301		
Output data	Seal: FPN	//	
Output data	1 20 mA 2 conductor		
	4 20 mA, 2 conductor $R_{Lmax} = (U_B - 1)$	2 V) / 20 mA [kΩ]	
Accuracy to DIN 16086, Max. setting	≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.		
Accuracy at minimum setting (B.F.S.L.)	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.		
Temperature compensation	0.0085% FS/°F typ.		
Temperature compensation	0.0085% ES/°E tvp		
Over range	0.014% FS/°F max.		
Non-linearity at max. setting to DIN 16086	≤ ± 0.3 % FS max.		
Hysteresis	≤ ± 0.4 % FS max.		
Repeatability	≤ ± 0.25 % FS		
Rise time	≤ 1.5 ms		
Long term drift	≤ ± 0.3 % FS typ. / year		
Environmental conditions			
Compensated temperature range	-4+185°F		
Operating temperature range	-4+140°F		
Storage temperature range	-40+212°F		
Fluid temperature range ²⁾	-40+140°F / -4+140°F		
C € - mark	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0 / 11 / 26 / 36		
Vibration resistance to DIN EN 60068-2-6 at 10500 Hz	≤ 20 g		
Protection class to IEC 60529	IP 65 (for male EN 1753) Binder 714 M18)	01-803 (DIN 43650) and	
	IP 67 (for M12x1 male, w IP 67 female conne	/hen an ector is used)	
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc	
Supply voltage	Ui = 12 28 V	12 28 V	
Max. input current	li = 100 mA		
Max. Input power	PI = 1 VV	max. power consuption ≤ 1 W	
Connection capacitance of the sensor	$C_i = \leq 22 \text{ nF}$		
Inductance of the sensor	$L_i = 0 \text{ mH}$	d avanualtaga protaction	
	EN 61000-6-2		
Other data			
Residual ripple of supply voltage	<u>≤ 5 %</u>		
Life expectancy			
Weight	~ 150 a		
Note: Reverse polarity protection of the supply voltage.	excess voltage.		
override and short circuit protection are provided. FS (Full Scale) = relative to the full measuring ran 1 15000 psi only with mechanical connection SF 2 2) -4°F with FPM seal, -40°F on request 9 500 V AC on request	ige, B.F.S.L.= B est F it S traight 250 CX20, Autoclave	Line	

Areas of application:

Protection types and applications		Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da Ex tb IIIC T80 °C Db	Ex ic IIC T6 Gc Ex ic IIIC T80 °C Dc	Ex ia IIIC T85 °C Da	
Zones / Categories		Equipment protec- tion level Ma Mining Protection class: intrinsically safe ia with barrier	Equipment protec- tion level Ga, Ga/Gb Gases Protection class: intrinsically safe ia with barrier	Equipment pro- tection level Gb Gases Protection class: intrinsically safe ia with barrier	Equipment protec- tion evel Gc Gases Protection class: non-sparking nA	Equipment protec- tion level Da, Db Conductive dust Protection class: Dustproof enclosure	Equipment protection level Gc, Dc Gases/conductive dust Protection class: Intrinsically safe ic with barrier	Equipment protec- tion level Da Conductive dust Protection class: intrinsically safe ia with barrier	
Electrical connection		4, 5, 6	4, 5, 6	4, 5, 6	6	6	4, 5, 6	4, 5, 6	
Code for use in Model code	IECEx	IECEx Australia							
1	✓	✓	 ✓ 	✓	✓				
9	 Image: A second s					✓			
А	✓						✓		
с	✓							×	
D	 Image: A second s		✓	✓	✓				✓

Certificate numbers: IECEx TSA 09.0041X, IECEx KEM 08.0014X

Devices in the ignition protection class "Dustproof enclosure" for the protection types Ex ta IIIC T80/90/100 °C Da T500T90/T100/T110°C Da, Ex tb IIIC T80/90/100 °C Db and Ex tc IIIC T80/90/100 °C Dc are available with flying leads on request. Devices in the ignition protection class "non-sparking" for protection types Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Model code:

HDA 4 4 X X – A – <u>XXXX</u> – I X X – <u>000</u> (PS	I)
Mechanical connection	
4 = Male 4 pole Binder series 714 M18 (connector not supplied) 5 = Male 3 pole + PE, EN 175301-803 (DIN 43650) (connector supplied) 6 = Male M12x1, 4 pole (connector not supplied) Signal	
A = 4 20 mA, 2 conductor	
Pressure ranges in psi	
Approval	
Insulation voltage	
Protection types and applications (code) 1 = Ex ia Ma Ex ia C T6 Ga Ex ia C T6 Ga/Gb Ex ia C T6 Gb	
9 = Ex nA IIC T6 Gc (only in conjunction with electr. connection "6")*	
$A = Ex ta IIIC 180 °C T_{500} 190 °C Da (only in conjunction with electr. connection "6")"Ex tb IIIC T80 °C Db$	
C = Ex ic IIC T6 Gc Ex ic IIIC T80 °C Dc	
D = Ex ia I Ma Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex ia IIC T85 °C Da	
Modification number 000 = Standard	

Notes:

*For design and electrical connection see Dimensions

Accessories:

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

Protection types and applications: (code): 1, C, D



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection, e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part No. 6098243

Pin connections:





-		
Pin	HDA 44x4-A	
1	n.c.	
2	Signal +	
3	Signal -	
4	n.c.	

EN 175301-803 (DIN 43650)



Pin	HDA 44x5-A
1	Signal +
2	Signal -
3	n.c.
1	Housing

M12x1, 4 pole



Pin	HDA 44x6-A	
1	Signal +	
2	n.c.	
3	Signal -	
4	n.c.	

Note:

The information in this brochure relates to

the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

DADINTERNATIONAL



Description:

The pressure transmitter HDA 4300 in IECEx Intrinsically Safe version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version. the HDA 4300 with IECEx Intrinsically Safe approval has the field-proven ceramic measuring cell with thick-film strain gauge.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust contamination, e.g. in mills.

Protection types and applications:

Ex ia I Ma

Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex nA IIC T6, T5, T4 Gc Ex ic IIC T6, T5, T4 Gc

Ex ta IIIC T80/90/100°C Da T₅₀₀ 90/100/110°C Da Ex tb IIIC T80/90/100°C Db Ex tc IIIC T80/90/100°C Dc Ex ic IIIC T80/90/100°C Dc Ex ia IIIC T85°C Da

Special features:

- Accuracy: ≤ ± 0.5 % FS B.F.S.L.
- Certificate: IECEx TSA 09.0041X / IECEx KEM 08.0014X
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4300 **IECEx Intrinsically Safe IECEx Dustproof Enclosure IECEx Non-sparking**



Technical data:

Input data					
Measuring ranges	15, 30, 50, 100, 150,	250, 500 psi			
Overload pressures	45, 100, 150, 290, 450, 725, 1500 psi				
Burst pressures	70, 150, 250, 400, 65	70, 150, 250, 400, 650, 1000, 2500 psi			
Mechanical connection	1/4-18 NPT male	· · ·			
Torque value	30 ft-lb (40 Nm)				
Parts in contact with medium	Sensor: Ce Mech. connection: 1.4 Seal: FF	eramic 4301 PM / EPDM			
Output data					
Output signal, permitted load resistance	4 20 mA, 2-conduct R _{Lmax} = (U	tor / _B – 12 V) / 20 mA [kΩ]			
Accuracy to DIN 16086, max. setting	≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.				
Accuracy at minimum setting (B.F.S.L.)	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.				
Temperature compensation Zero point	≤ ± 0.012% FS/°F typ ≤ ± 0.017% FS/°F ma). AX.			
Temperature compensation Over range	≤ ± 0.012% FS/°F typ ≤ ± 0.017% FS/°F ma). AX.			
Non-linearity at max. setting to DIN 16086	≤ ± 0.5 % FS max.				
Hysteresis	≤ ± 0.4 % FS max.				
Repeatability	≤±0.1 % FS				
Rise time	≤ 1.5 ms				
Long term drift	≤ ± 0.3 % FS typ. / ye	ear			
Environmental conditions					
Compensated temperature range	-4+185°F				
Operating temperature range	-4+140°F				
Storage temperature range	-40+212°F				
Fluid temperature range ¹⁾	-40+140°F / -4+14	l0°F			
C € - mark	EN 61000-6-1 / 2 / 3 EN 60079-0 / 11 / 26	/ 4 / 36			
Vibration resistance to DIN EN 60068-2-6 at 10500 Hz	≤ 20 g				
Protection class to IEC 60529	IP 65 (for male EN 1 and Binder 71 IP 67 (for M12x1 ma IP 67 female c	75301-803 (DIN 43650) 4 M18) ale, when an connector is used)			
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc			
Supply voltage	<u>Ui = 12 28 V</u>	12 28 V			
Max. input current Max. input power	Pi = 100 mA	max. power consuption			
Connection capacitance of the sensor	C _i = ≤ 22 nF				
Inductance of the sensor	$L_i = 0 \text{ mH}$				
Insulation voltage 2)	50 V AC, with integra EN 61000-6-2	ted overvoltage protection			
Other data	F 0/				
Residual ripple of supply voltage	≤ 5 %				
	0 100 % FS				
Weight	~ 180 a				
Note: Reverse polarity protection of the supply override and short circuit protection are p	voltage, excess voltage, rovided.				

ro (ruii Scale) = relative to the full measuring range, **B.F.S.L.= B**est **F**it **S**traight ¹⁾ -4 °F with FPM or EPDM seal, -40 °F on request ²⁾ 500 V AC on request

Areas of application:

Protection types and applications		Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80°C T ₅₀₀ T90°C Da Ex tb IIIC T80°C Db	Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc	Ex ia IIIC T85° C Da	
Zones / Categories		Equipment level standard Ma Mining Protection class: intrinsically safe ia with barrier	Equipment level standard Ga, Ga/Gb Gases Protection class: intrinsically safe ia with barrier	Equipment level standard Gb Gases Protection class: intrinsically safe ia with barrier	Equipment level standard Gc Gases Protection class: non-sparking nA	Equipment level standard Da, Db Conductive dust Protection class: Dustproof enclosure	Equipment level standard Gc, Dc Gases/conductive dust Protection class: Intrinsically safe ic with barrier	Equipment level standard Da Conductive dust Protection class: intrinsically safe ia with barrier	
Electrical connection		4, 5, 6	4, 5, 6	4, 5, 6	6	6	4, 5, 6	4, 5, 6	
Code (see model code)	IECEx	IECEx Australia							
1	✓	✓	~	×	✓				
9	✓					✓			
А	✓						✓		
с	✓							×	
D	✓		~	 ✓ 	✓				 ✓

Certificate numbers: IECEx TSA 09.0041X, IECEx KEM 08.0014X

Devices in the ignition protection class "Dustproof enclosure" for the protection types Ex ta IIIC T80/90/100° C Da T500T90/T100/T110°C Da, Ex tb IIIC T80/90/100°C Db and Ex tc IIIC T80/90/100°C Dc are available with flying leads on request. Devices in the ignition protection class "non-sparking" for protection type Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Model code:

HDA 4 3 8 X – A – <u>XXXX</u> – I X X – <u>000</u> – X 1 (PSI
Mechanical connection
8 = 1/4-18 NPT male
Electrical connection
4 = Male, 4 pole Binder series 714 M18 (connector not supplied)
5 = Male, 3 pole + PE, EN 175301-803 (DIN 43650) (connector supplied) $6 = Male M12x1 4 pole (connector not supplied)$
Signal
A = 4 20 mA, 2 conductor
Pressure ranges in psi
0015, 0030, 0050, 0100, 0150, 0250, 0500
Approval
Insulation voltage \sim
Protection types and applications (code)
1 = Exia Ma
Ex ia IIC T6 Ga
Ex ia IIC T6 Ga/Gb
Ex la IIC 16 Gb
9 = Ex nA IIC T6 Gc (only in conjunction with electr. connection "6")*
A = Ex ta IIIC T80°C T ₅₀₀ T90°C Da (only in conjunction with electr. connection 6")* Ex tb IIIC T80°C Db
C = Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc
D = Exia Ma
Ex ia IIC T6 Ga
EX Ia IIC To Ga/GD
Ex la IIIC T85°C Da
Modification number
000 = Standard
Seal material (in contact with fluid)
F = FPM seal (e.g.: for hydraulic oils)
E = EPDM seal (e.g.: for reingerants)
1 = Stainless steel
Notes:
* For design and electrical connection see device dimensions
Accessories
Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

US 18.392.3.0/10.17

Protection types and applications (code): 1, C, D



Pin connections:





Pin	HDA 43x4-A
1	n.c.
2	Signal +
3	Signal -
4	n.c.

EN 175301-803 (DIN 43650)



Pin	HDA 43x5-A
1	Signal +
2	Signal -
3	n.c.
\perp	Housing

M12x1, 4 pole



Pin	HDA 43x6-A
1	Signal +
2	n.c.
3	Signal -
4	n.c.

US 18.392.3.0/10.17

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

GYDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4100 in IECEx Intrinsically Safe version has been specially developed for use in potentially explosive atmospheres for absolute measurement in the low pressure range and is based on the HDA 4000 series.

As with the industrial version, the HDA 4100 with IECEx Intrinsically Safe approval has the field-proven ceramic measuring cell with thick-film strain gauge without interior seals.

Intended areas of application are, for example, in the oil and gas industry, in mining, on gas turbines or in locations with high levels of dust contamination, e.g. in mills.

Protection types and applications: Ex ia I Ma

Ex la l Ma

Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex nA IIC T6,T5,T4 Gc Ex ic IIC T6,T5,T4 Gc

Ex ta IIIC T80/90/100°C Da T₅₀₀ 90/100/110°C Da Ex tb IIIC T80/90/100°C Db Ex tc IIIC T80/90/100°C Dc Ex ic IIIC T80/90/100°C Dc Ex ia IIIC T85°C Da

Special features:

• Accuracy: $\leq \pm 0.5 \%$ FS B.F.S.L.

- Certificate: IECEx TSA 09.0041X / IECEx KEM 08.0014X
- Output signal 4 .. 20 mA
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Absolute Pressure Transmitter HDA 4100 IECEx Intrinsically Safe IECEx Dustproof Enclosure IECEx Non-sparking



Technical data:

Measuring ranges	15 50 psia	
	40, 150 psia	
Puret proseuros	70, 250 psia	
Buist pressures	10, 250 psia	
	1/4-18 NP1 male	
Iorque value	30 ft-lb (40 Nm)	
Parts in contact with medium	Sensor: Mech. connection:	Ceramic 1.4301
Output data	Seal.	
	1 00 m A 0 a m due	4
	4 20 mA, 2 conduc R _{Lmax} = (L	tor J _B – 12 V) / 20 mA [kΩ]
Accuracy to DIN 16086, max. setting	≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.	
Accuracy at minimum setting (B.F.S.L.)	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.	
Temperature compensation	≤ ± 0.012% FS/°F typ	0.
zero point	≤ ± 0.017% FS/°F ma	ax.
Temperature compensation over range	≤ ± 0.012% FS/°F typ ≤ ± 0.017% FS/°F ma	D. BX.
Non-linearity at max. setting to DIN 16086	≤ ± 0.5 % FS max.	
Hysteresis	≤ ± 0.4 % FS max.	
Repeatability	≤±0.1 % FS	
Rise time	< 1.5 ms	
Long term drift	< + 0.3 % ES typ / ye	Par
Environmental conditions	<u>= = 0.0 /01 0 typ. / yt</u>	
Compensated temperature range	-4 +185°F	
Operating temperature range	4 +140°E	
Storago tomporaturo rango	40 ±212°E	
	-40+212 F	10°E
	-40+140 F / -4+14	
C € ⁻ mark	EN 60079-0 / 11 / 26	/ 36
Vibration resistance to DIN EN 60068-2-6 at 10500 Hz	≤ 20 g	
Protection class to IEC 60529	IP 65 (for male EN and Binder 71	175301-803 (DIN 43650) 14 M18)
	IP 67 (for M12x1 m	ale, when an
	IP 67 female	connector is used)
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc
Supply voltage	Ui = 1228 V	12 28 V
Max. input current	li = 100 mA	
Max. Input power	PI = 1 W	max. power consuption
Connection capacitance of the sensor	C; = ≤ 22 nF	
Inductance of the sensor	$L_i = 0 \text{ mH}$	
Insulation voltage 2)	50 V AC, with integra EN 61000-6-2	ted overvoltage protection
Other data		
Residual ripple of supply voltage	<u>≤ 5 %</u>	
Life expectancy	> 10 million cycles	
Maisht	<u> </u>	
1/1// 1// 1// 1//	~ 100 y	

¹⁾ -4 °F with FPM or EPDM seal, -40 °F on request ²⁾ 500 V AC on request

Areas of application:

Protection types and applications			Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80°C T ₅₀₀ T90°C Da Ex tb IIIC T80°C Db	Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc	Ex ia IIIC T85° C Da
Zones / Categories			Equipment level standard Ma Mining Protection class: intrinsically safe ia with barrier	Equipment level standard Ga, Ga/Gb Gases Protection class: intrinsically safe ia with barrier	Equipment level standard Gb Gases Protection class: intrinsically safe ia with barrier	Equipment level standard Gc Gases Protection class: non-sparking nA	Equipment level standard Da, Db Conductive dust Protection class: Dustproof enclosure	Equipment level standard Gc, Dc Gases/conductive dust Protection class: Intrinsically safe ic with barrier	Equipment level standard Da Conductive dust Protection class: intrinsically safe ia with barrier
Electrical connection		4, 5, 6	4, 5, 6	4, 5, 6	6	6	4, 5, 6	4, 5, 6	
Code (see model code)	IECEx	IECEx Australia							
1	✓	✓	✓	×	✓				
9	✓					✓			
А	✓						✓		
с	✓							×	
D	✓		✓	√	✓				×

Certificate numbers: IECEx TSA 09.0041X, IECEx KEM 08.0014X

Devices in the ignition protection class "Dustproof enclosure" for the protection types Ex ta IIIC T80/90/100° C Da T500T90/T100/T110°C Da, Ex tb IIIC T80/90/100°C Db and Ex tc IIIC T80/90/100°C Dc are available with flying leads on request. Devices in the ignition protection class "non-sparking" for protection type Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Model code:

HDA 4 1 8 X – A – <u>XXXX</u> – I X X – <u>000</u> – X 1 (PS)							
Mechanical connection								
8 = 1/4-18 NPT male								
Electrical connection								
4 = Male, 4 pole Binder series 714 M18 (connector not supplied)								
5 = Male, 3 pole + PE, EN 1/5301-803 (DIN 43650) (connector supplied) 6 = Male, M12x1, 4 pole (connector not supplied)								
Signal								
A = 4 20 mA, 2 conductor								
Pressure ranges in psi								
0015, 0050								
Approval								
I = IECEx								
Insulation voltage								
N = 50 V AC								
Protection types and applications (code)								
1 = Ex ia I Ma								
Exia IIC T6 Ga								
$\rho = Ex pA \parallel C Te Co (only in conjugation with closer connection "6")*$								
9 - Ex that is to be (only in conjunction with electric connection "0") A - Ex to IIIC TOOSC T. TOOSC De (only in conjunction with electric connection "0")*								
$A = Ex ta file 180 C T_{500} 190 C Da (only in conjunction with electr. connection 6)^{*}$ Ex tb IIIC T80°C Db								
C = Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc								
D = Ex ia I Ma								
Ex ia IIC T6 Ga								
EX IA IIC TO GA/GD								
Exia IIIC T85°C Da								
Modification number								
000 = Standard								
Seal material (in contact with fluid)								
F = FPM seal (e.g.: for hydraulic oils)								
E = EPDM seal (e.g.: for refrigerants)								
Material of connection (in contact with fluid) 1 = Stainless steel								
Notes:								
* For design and electrical connection see device dimensions								
Accessories:								
Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.								

US 18.392.2.0/10.17
Protection types and applications: (code): 1, C, D



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection; e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part No. 6098243

Pin connections:

Binder series 714 M18



Pin	HDA 41x4-A	
1	n.c.	
2	Signal +	
3	Signal -	
4	n.c.	

EN 175301-803 (DIN 43650)



Pin	HDA 41x5-A
1	Signal +
2	Signal -
3	n.c.
\perp	Housing

M12x1, 4 pole



Pin	HDA 41x6-A	
1	Signal +	
2	n.c.	
3	Signal -	
4	n.c.	

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For European mechanical connection and bar ranges see European Catalog

HYDAC ELECTRONICS 90 Southland Dr. Bethlehem, PA 18017 Telephone +1 (610) 266-0100 E-mail: electronics@hydacusa.com Website: www.hydacusa.com

YDAD INTERNATIONAL



Description:

The pressure transmitter HDA 4700 in ATEX version with flush membrane has been specially developed for use in potentially explosive atmospheres.

Like the standard model, the HDA 4700 with flush membrane has a stainless steel measurement cell with a thin film strain gauge.

The pressure connection is achieved with an all-welded stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid.

This device is used for applications in which a standard pressure connection could become blocked, clogged or frozen by the particular medium used. Further applications include processes where the medium changes regularly and any residues could cause mixing or contamination of the media, or in highly viscous media. Intended areas of application are, for example, the oil and gas industry, in mines or in locations with high levels of dust, e.g. in mills.

Protection types and applications: I M1 Ex ia I Ma

II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 3G Ex nA IIC T6, T5, T4 Gc II 3G Ex ic IIC T6, T5, T4 Gc

II 1D Ex ia IIIC T85 °C Da II 1D Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da II 2D Ex tb IIIC T80/90/100 °C Db II 3D Ex tc IIIC T80/T90/T100 °C Dc II 3D Ex ic IIIC T80/T90/T100 °C Dc

Special features:

- Pressure connection has a flush membrane
- Accuracy ≤ 0.25 % FS B.F.S.L.
- Certificates: KEMA 05ATEX1016 X KEMA 05ATEX1021
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Electronic **Pressure Transmitter** HDA 4700 with Flush Membrane ATEX Intrinsically Safe ATEX Dustproof Enclosure ATEX Non-sparking



Technical data:

Input data		
Measuring ranges	500, 750, 1000, 1500, 3000,	6000, 9000 psi
Overload ranges	1160, 1740, 2900, 2900, 725	0, 11600, 14500 psi
Burst pressure 1)	2900, 4350, 7250, 7250, 145	i00, 29000, 29000 psi
Mechanical connection	G1/2 A DIN 3852 G1/2 with additional front O-	ing seal
Pressure transfer fluid	Silicon-free oil	
Torque value	33 ft-lb (45 Nm)	
Parts in contact with medium 2)	Stainless steel: 1.44 Seal: FPM O-ring: FPM	35; 1.4301
Output data		
Output signal, permitted load resistance	4 20 mA, 2 conductor R _{Lmax} = (U _B – 12 V) / 20 mA [I	(Ω]
Accuracy to DIN 16086, max. setting	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.	
Accuracy at minimum setting (B.F.S.L.)	≤ ± 0.15 % FS typ. ≤ ± 0.25 % FS max.	
Temperature compensation Zero point	≤ ± 0.0045% FS/°F typ. ≤ ± 0.0085% FS/°F max.	
Temperature compensation Over range	≤ ± 0.0045% FS/°F typ. ≤ ± 0.0085% FS/°F max.	
Non-linearity at max. setting to DIN 16086	≤ ± 0.3 % FS max.	
Hysteresis	≤ ± 0.1 % FS max.	
Repeatability	≤ ± 0.05 % FS	
Rise time	≤ 1.5 ms	
Long term drift	≤ ± 0.1 % FS typ. / year	
Environmental conditions		
Compensated temperature range	-4+185°F	
Operating temperature range ³⁾	-40+140°F/ -4+140°F	
Storage temperature range	-40+212°F	
Fluid temperature range ³⁾	-20+140°F -40+140°F / -4+140°F	
(€ mark	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0 / 11 / 26 / 31 EN 50303	
Vibration resistance to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g	
Protection class to IEC 60529	IP 65 (for male EN 175301 IP 67 (for M12x1 male, who IP 67 female connect	-803(DIN 43650)) en an or is used)
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc
Supply voltage	Ui = 1228 V	12 28 V
Max. input current	li = 100 mA	
Max. input power	$P_I = 1 W$	max. power consuption ≤ 1 W
Lonnection capacitance of the sensor	$U_i = \leq 22 \text{ nF}$	
Insulation voltage 4)	50 V AC, with integrated ove EN 61000-6-2	ervoltage protection
Other data		
Residual ripple of supply voltage	≤ 5 %	
Life expectancy	> 10 million cycles 0 100 % FS	
Weight	~ 180 g	
Note: Decision of the control of the control of the		I The state of the

Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided

- FS (Full Scale) = relative to complete measuring range B.F.S.L. = Best Fit Straight Line
- ¹⁾ G1/2 with additional front O-ring seal max. 21750 psi
- ²⁾ Other seal materials on request
 ³⁾ -4 °F with FPM seal, -40 °F on request
- 4) 500 V AC on request

Areas of application:

Code used in Model code	1		9	А	с	
Protection type	I M1 Ex ia I Ma	II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 1D Ex ia IIIC T85°C Da	II 2G Ex ia IIC T6 Gb	II 3G Ex nA IIC T6 Gc	II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da II 2D Ex tb IIIC T80°C Db	II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Certificate		KEMA 05ATEX1016 X / KEMA 05ATEX1021				
	Group I Category M1	Group II, III Category 1G, 1/2G, 1D	Group II Category 2G	Group II Category 3G	Group III Category 1D, 2D	Group II, III Category 3G, 3D
Zones /	Mining	Gases/conductive dust	Gases	Gases	Conductive dust	Gases/conductive dust
Categories	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: Non-sparking nA	Protection class: Dustproof enclosure	Protection class: Intrinsically safe ic with barrier
Electrical Connection (see model code)	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types II 1D Ex ta IIIC T80/90/100° C Da T₅₀₀T90/T100/T110° C Da, II 2D Ex tb IIIC T80/90/100° C Db and II 3D Ex tc IIIC T80/90/100° C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type II 3G Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:

Pin connections:	Model code:				
EN175301-803 (DIN 43650)	HDA 4 7 X X – A – <u>XXXX</u> – <u>XXX</u> – A X X – <u>000</u> (PSI)				
	Mechanical process connection Z = Flush membrane Electrical connection 5 = Male 3 pole + PE, EN 175301-803 (DIN 43650) (female connector supplied) 6 = Male M42vit 4 page				
Pin HDA 47Z5-A	(female connector not supplied)				
1 Signal +	Signal				
2 Signal -	A = 4 20 mA, 2 conductor				
3 n.c.	0500, 0750, 1000, 1500, 3000, 5000, 6000, 9000				
⊥ Housing	Mechanical connection				
M10v1_1_polo	G01 = G1/2 A, DIN 3852 G02 = G1/2 with additional front O-ring seal				
	Approval A = ATEX Insulation voltage N = 50 V AC Protection types and applications (code) 1 = I M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2C Ex ia IIC T6 Ga/Gb				
Pin HDA 47Z6-A	II 1D Ex ia IIIC T85 °C Da				
1 Signal +	9 = II 3G Ex nA IIC T6 Gc				
2 n.c. 3 Signal - 4 n.c.	A = II 1D Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da (only in conjunction with electr. connection "6")* II 2D Ex tb IIIC T80 °C Db				
	C = II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80 °C Dc				
	Modification number				
	Notes: For design and electrical connection see Dimensions 				
	Accessories: Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.				

3

Protection types and applications (code): 1, C







Protection types and applications (code): 9, A



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection, e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part. No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications. For bar ranges see European Catalog

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Description:

The pressure transmitter HDA 4400 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version, the HDA 4400 in ATEX version has a stainless steel measurement cell with thinfilm strain gauge.

The pressure connection is achieved with an all-welded stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid.

This device is used for applications in which a standard pressure connection could become blocked, clogged or frozen by the particular medium used. Further applications include processes where the medium changes regularly and any residues could cause mixing or contamination of the media. Intended areas of application are, for example, the oil and gas industry, in mines, or in locations with high levels of dust, e.g. in mills.

Protection types and applications: I M1 Ex ia I Ma

II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 3G Ex nA IIC T6, T5, T4 Gc II 3G Ex ic IIC T6,T5,T4 Gc

II 1D Ex ia IIIC T85 °C Da II 1D Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da II 2D Ex tb IIIC T80/90/100 °C Db II 3D Ex tc IIIC T80/T90/T100 °C Dc II 3D Ex ic IIIC T80/T90/T100 °C Dc Special features:

- Pressure connection has a flush membrane
- Accuracy ≤ 0.5 % FS B.F.S.L.
- Certificates: KEMA 05ATEX1016 X KEMA 05ATEX1021
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Electronic Pressure Transmitter HDA 4400 with Flush Membrane **ATEX Intrinsically Safe** ATEX Dustproof Enclosure ATEX Non-sparking



Technical data:

Input data				
Measuring ranges	500, 750, 1000, 1500, 3000, 600	00, 9000 psi		
Overload ranges	1160, 1740, 2900, 2900, 7250, 11600, 14500 psi			
Burst pressure 1)	2900, 4350, 7250, 7250, 14500, 29000, 29000 psi			
Mechanical connection	G1/2A DIN 3852			
	G1/2 with add. front O-ring seal			
	G1/4 with add. front O-ring seal			
Pressure transfer fluid	Silicon-free oil			
Torque value	33 ft-lb (45 Nm) for G1/2, G1/2A 15 ft-lb (20 Nm) for G1/4	N		
Parts in contact with medium ²⁾	Stainless steel: 1.4435;	1.4301		
	Seal: FPM			
Output data	O-ring: FPM			
Output data	1 00 m A 0 conductor			
	4 20 mA, 2 conductor $R_{Lmax} = (U_B - 12 V) / 20 mA [kΩ]$			
Accuracy to DIN 16086,	≤ ± 0.5 % FS typ.			
Max. Setting				
(BESL)	> ± 0.25 % FS typ. < + 0.5 % FS max			
Temperature compensation	< + 0.0085% ES/°E typ			
Zero point	$\leq \pm 0.014\%$ FS/°F max.			
Temperature compensation	≤ ± 0.0085% FS/°F typ.			
Over range	≤ ± 0.014% FS/°F max.			
Non-linearity at max. setting to DIN 16086	≤ ± 0.3 % FS max.			
Hysteresis	≤ ± 0.4 % FS max.			
Repeatability	≤ ± 0.1 % FS			
Rise time	≤ 1.5 ms			
Long term drift	≤ ± 0.3 % FS typ. / year			
Environmental conditions				
Compensated temperature range	-4+185°F			
Operating temperature range	-4+140°F			
Storage temperature range	-40+212°F			
Fluid temperature range ³⁾	-40+140°F / -4+140°F			
(Emark	EN 61000-6-1 / 2 / 3 / 4			
	EN 60079-0 / 11 / 26 / 31			
	EN 50303			
Vibration resistance to DIN EN 60068-2-6 at 10500 Hz	≤ 20 g			
Protection class to IEC 60529	IP 65 (for male EN 175301-803	3(DIN 43650))		
	IP 67 (for M12x1 male, when a	an ia uaad)		
Polovant data for Ex applications	Exis is	nA to the to		
	Li = 12 28 V 12	28 V		
Max. input current	li = 100 mA			
Max. input power	Pi = 1 W ma	x. power consuption		
-	≤ 1	W		
Connection capacitance of the sensor	$C_i = \leq 22 \text{ nF}$			
Inductance of the sensor	$L_i = 0 \text{ mH}$			
	EN 61000-6-2			
Other data				
Residual ripple of supply voltage	< 5 % 			
Life expectancy	> 10 million cycles			
Weight	~ 180 g			
Molynt	100 g			

Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are FS (Full Scale) = relative to complete measuring range

- **B.F.S.L.** = Best Fit Straight Line
- ¹⁾ G1/2 with additional front O-ring seal max. 21750 psi
- ²⁾ Other seal materials on request
 ³⁾ -4 °F with FPM seal, -40 °F on request
 - 4) 500 V AC on request

Areas of application:

Code used in Model code	1			9	А	с
Protection type	I M1 Ex ia I Ma	II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 1D Ex ia IIIC T85°C Da	II 2G Ex ia IIC T6 Gb	II 3G Ex nA IIC T6 Gc	II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da II 2D Ex tb IIIC T80°C Db	II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Certificate		KEMA 05ATEX1016 X / KEMA 05ATEX1021				
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II, III Category 1G, 1/2G, 1D Gases/conductive dust Protection class: intrinsically safe ia with barrier	Group II Category 2G Gases Protection class: intrinsically safe ia with barrier	Group II Category 3G Gases Protection class: Non-sparking nA	Group III Category 1D, 2D Conductive dust Protection class: Dustproof enclosure	Group II, III Category 3G, 3D Gases/conductive dust Protection class: Intrinsically safe ic with barrier
Electrical Connection (see model code)	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types II 1D Ex ta IIIC T80/90/100° C Da T₅₀₀T90/T100/T110°C Da, II 2D Ex tb IIIC T80/90/100°C Db and II 3D Ex tc IIIC T80/90/100°C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type II 3G Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Model code:

Pin connections: EN 175301-803 (DIN

HDA 44Z5-A

Signal +

Signal -

Housing

HDA 44Z6-A

Signal +

Signal -

n.c.

n.c.

n.c.

M12x1, 4 pole

Pin

1

2

3

 \bot

Pin

1

2

3

4

12

	model code.
43650)	HDA 4 4 Z X – A – <u>XXXX</u> – <u>XXX</u> – A X X – <u>000</u> (PSI)
2]	Mechanical process connection Z = Flush membrane Electrical connection 5 = Male 3 pole + PE, EN 175301-803 (DIN 43650) (female connector supplied) 6 = Male M12x1, 4 pole (female connector not supplied) 6 and M12x1, 4 pole (female connector not supplied) Signal A = 420 mA, 2 conductor
	Pressure ranges in psi
	Mechanical connectionG01= G1/2 A, DIN 3852G02= G1/2 with additional front O-ring sealG04= G1/4 with additional front O-ring seal
	Approval
3•	Insulation voltage
2	Protection types and applications (code) 1 = I M1 Ex ia I Ma II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 1D Ex ia IIIC T85 °C Da
	9 = II 3G Ex nA IIC T6 Gc (only in conjunction with electr. connection "6")*
	A = II 1D Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da (only in conjunction with electr. connection "6")* II 2D Ex tb IIIC T80 °C Db
	C = II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80 °C Dc
	Modification number 000 = Standard
	Notoo

* For design and electrical connection see Dimensions

Accessories:

Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.

Protection types and applications (code): 1, C













Protection types and applications (code): 9, A



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection. e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part. No. 6098243 Note: The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications. For bar ranges see European Catalog

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Description:

The pressure transmitter HDA 4300 in ATEX version has been specially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version, the HDA 4300 in ATEX version has the fieldproven ceramic measurement cell with thick-film strain gauge.

The pressure connection is achieved with an all-welded stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid.

This device is used for applications in which a standard pressure connection could become blocked, clogged or frozen by the particular medium used. Further applications include processes where the medium changes regularly and any residues could cause mixing or contamination of the media. Intended areas of application are, for example, the oil and gas industry, in mines, or in locations with high levels of dust, e.g. in mills.

Protection types and applications: I M1 Ex ia I Ma

II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 2G Ex ia IIC T6 Gb II 3G Ex nA IIC T6, T5, T4 Gc II 3G Ex ic IIC T6, T5, T4 Gc

II 1D Ex ia IIIC T85°C Da II 1D Ex ta IIIC T80/90/100°C Da T₅₀₀T90/T100/T110°C Da

II 2D Ex tb IIIC T80/90/100°C Db II 3D Ex tc IIIC T80/T90/T100°C Dc II 3D Ex ic IIIC T80/T90/T100°C Dc

Special features:

- Pressure connection has a flush membrane
- Accuracy: ≤ ± 0.5 % FS B.F.S.L.
- Certificates: KEMA 05ATEX1016 X KEMA 05ATEX1021
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4300 with Flush Membrane **ATEX Intrinsically Safe** ATEX Dustproof Enclosure ATEX Non-sparking

Technical data:

Input data	
Measuring ranges	15, 30, 50, 100, 150, 250, 500 psi
Overload range	45, 100, 150, 290, 450, 725, 1500 psi
Burst pressure	70, 150, 250, 400, 650, 1000, 2500 psi
Mechanical connection	G1/2A DIN 3852 G1/2 with additional front O-ring seal G1/4 with additional front O-ring seal
Pressure transfer fluid	Silicon-free oil
Torque value	33 ft-lb (45 Nm) for G1/2, G1/2A 15 ft-lb (20 Nm) for G1/4
Parts in contact with medium ¹⁾	Stainless steel: 1.4435; 1.4301 Seal: FPM O-ring: FPM
Output data	
Output signal, permitted load resistance	4 20 mA, 2 conductor R _{Lmax} = (U _B – 12 V) / 20 mA [kΩ]
Accuracy to DIN 16086, max. setting	≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.
Accuracy at minimum setting (B.F.S.L.)	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.
Temperature compensation Zero point	≤ ± 0.012% FS/°F typ. ≤ ± 0.017% FS/°F max.
Temperature compensation Over range	≤ ± 0.012% FS/°F typ. ≤ ± 0.017% FS/°F max.
Non-linearity at max. setting to DIN 16086	≤ ± 0.5 % FS max.
Hysteresis	≤ ± 0.4 % FS max.
Repeatability	≤ ± 0.1 % FS
Rise time	≤ 1.5 ms
Long term drift	≤ ± 0.3 % FS typ. / year
Environmental conditions	
Compensated temperature range	-4+185°F
Operating temperature range	4+140°F
Storage temperature range	-40 to 212°F
Fluid temperature range ²⁾	-40+140°F / -4+140°F
CE-mark	EN 61000-6-1/2/3/4 EN 60079-0/11/26/31 EN 50303
Vibration resistance to DIN EN 60068-2-6 at 10500 Hz	≤ 20 g
Protection class to IEC 60529	IP 65 (for male EN 175301-803(DIN 43650)) IP 67 (for M12x1 male, when an IP 67 female connector is used)
Relevant data for Ex applications	Ex ia, ic Ex nA, ta, tb, tc
Supply voltage	Ui = 12 28 V 12 28 V
Max. input current	li = 100 mA
Max. input power	Pi = 1 W max. power consuption ≤ 1 W
Connection capacitance of the sensor	$C_i = \leq 22 \text{ nF}$
Inductance of the sensor	$L_i = U MH$
	EN 61000-6-2
Other data	~ 5 %
	≥ 0 %
Lie capeciancy	0 100 % FS
Weight	~ 180 g
Note: Reverse polarity protection of the supply vo	Itage, excess voltage, override and short circuit protection

provided.

Provided.
FS (Full Scale) = relative to complete measuring range
B.F.S.L. = Best Fit Straight Line
Other seal materials on request
-4 °F with FPM seal, -40 °F on request
500 V AC on request

Areas of application:

Code Model code	1		9	А	с	
Protection type	I M1 Ex ia I Ma	II 1G Ex ia IIC T6 Ga II 1/2G Ex ia IIC T6 Ga/Gb II 1D Ex ia IIIC T85°C Da	II 2G Ex ia IIC T6 Gb	II 3G Ex nA IIC T6 Gc	II 1D Ex ta IIIC T80°C T ₅₀₀ T90°C Da II 2D Ex tb IIIC T80°C Db	II 3G Ex ic IIC T6 Gc II 3D Ex ic IIIC T80°C Dc
Certificate			KEMA 05ATEX10	16 X / KEMA 05ATEX102	1	
Zones / Categories	Group I Category M1 Mining Protection class: intrinsically safe ia with barrier	Group II, III Category 1G, 1/2G, 1D Gases/conductive dust Protection class: intrinsically safe ia with barrier	Group II Category 2G Gases Protection class: intrinsically safe ia with barrier	Group II Category 3G Gases Protection class: Non-sparking nA	Group III Category 1D, 2D Conductive dust Protection class: Dustproof enclosure	Group II, III Category 3G, 3D Gases/conductive dust Protection class: Intrinsically safe ic with barrier
Electrical Connection (see model code)	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types II 1D Ex ta IIIC T80/90/100° C Da T₅₀₀T90/T100/T110°C Da, II 2D Ex tb IIIC T80/90/100°C Db and II 3D Ex tc IIIC T80/90/100°C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type II 3G Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:

EN 175301-803 (DIN 43650)

Model code:

1	HDA 43Z5-A
	Signal +
	Signal -

Pir 1 2

3

Т

M12x1, 4 pole

n.c. Housing



Pin	HDA 43Z6-A	
1	Signal +	
2	n.c.	
3	Signal -	
4	n.c.	

HDA 4 3 Z X – A – <u>XXXX</u> – <u>XXX</u> – A X X – <u>000</u> (PSI
Mechanical process
Z = Flush membrane
Electrical connection
5 = Male 3 pole + PE,
EN 175301-803 (DIN 43650)
(female connector supplied)
6 = Male M12x1, 4 pole
(female connector not supplied)
Signal
A = 4 20 mA, 2 conductor
Pressure ranges in psi
0015, 0030, 0050, 0100, 0150, 0250, 0500
Mechanical connection
G01 = G1/2 A, DIN 3852
G02 = G1/2 with additional front O-ring seal
Approval
Insulation voltage
Protection types and applications (code)
1 = I M1 Ex ia I Ma
II 1G Ex ia IIC T6 Ga
II 1/2G Ex ia IIC T6 Ga/Gb
II 2G Ex la IIC 16 Gb
9 = II 3G Ex nA IIC T6 GC
(only in conjunction with electr. connection "6")*
A = II 1D Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da
(only in conjunction with electr. connection "6")*
C = II 3G EX IC IIC 16 GC
Modification number
Netoo
Notes.
רטו עבאואו מוע בופטווטמו טטווופטוטוו גפר טווופווגוטווג
Accessories:

Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.

Protection types and applications (code): 1, C



male electr. conn. 3p +PE EN 175301-803 (DIN 43650)









Protection types and applications (code): 9, A



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection. e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part. No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications. For bar ranges see European Catalog



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Description:

The pressure transmitter HDA 4700 in IECEx Intrinsically Safe version has been especially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version of the HDA 4700, devices with IECEx Intrinsically Safe approval have a field-proven, all-welded stainless steel measurement cell with thin-film strain gauge without internal seal.

The pressure connection is achieved with an all-welded stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid.

This device is used for applications in which a standard pressure connection could become blocked, clogged or frozen by the particular medium used. Further applications include processes where the medium changes regularly and any residues could cause mixing or contamination of the media, or in highly viscous media. Intended areas of application are, for example, the oil and gas industry, in mines or in locations with high levels of dust, e.g. in mills.

Protection types and applications: Ex ia I Ma

Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex nA IIC T6,T5,T4 Gc Ex ic IIC T6, T5, T4 Gc

Ex ta IIIC T80/90/100°C Da T_00/100/110°C Da Ex tb IIIC T80/90/100°C Db Ex tc IIIC T80/90/100°C Dc Ex ic IIIC T80/90/100°C Dc Ex ia IIIC T85°C Da

Special features:

- Pressure connection has a flush membrane
- Accuracy ≤ 0.25 % FS B.F.S.L. Certificate: IECEx KEM 08.0014X
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Electronic Pressure Transmitter HDA 4700 with Flush Membrane **IECEx Intrinsically Safe IECEx Dustproof Enclosure IECEx Non-sparking**



Technical data:

Input data				
Measuring ranges	500, 750, 1000, 1500, 30	500, 750, 1000, 1500, 3000, 6000, 9000 psi		
Overload ranges	1160, 1740, 2900, 2900,	7250, 11600, 14500 psi		
Burst pressure ¹⁾	2900, 4350, 7250, 7250,	14500, 29000, 29000 psi		
Mechanical connection	G1/2 A DIN 3852			
	G1/2 with additional front	O-ring seal		
Pressure transfer fluid	Silicon-free oil			
Torque value	33 ft-lb (45 Nm)			
Parts in contact with medium ²⁾	Stainless steel: 1.	4435; 1.4301		
	Seal: FF	PM		
	O-ring: FF	PM		
Output data	¥			
Output signal, permitted load resistance	420 mA, 2 conductor			
	$R_{Lmax} = (U_B - 12 \text{ V}) / 20 \text{ m}$	hΑ [kΩ]		
Accuracy to DIN 16086,	≤ ± 0.25 % FS typ.			
max. setting	≤ ± 0.5 % FS max.			
Accuracy at minimum setting	≤ ± 0.15 % FS tvp.			
(B.F.S.L.)	≤ ± 0.25 % FS max.			
Temperature compensation	≤ ± 0.0045% FS/°F tvp.			
zero point	$\leq \pm 0.0085\%$ FS/°F max.			
Temperature compensation	< + 0.0045% ES/°E tvp			
over range	$< \pm 0.0040\% FS/^{\circ}F$ max			
Non-linearity at max setting	< + 0.3 % FS max			
to DIN 16086	5 ± 0.5 % T 5 Max.			
Hysteresis	< + 0.1 % ES max			
Repeatability	< + 0.05 % FS			
Riss time				
	$\leq \pm 0.1 \%$ FS typ. / year			
Environmental conditions				
Compensated temperature range	-20+85 °C to -4+185°F			
Operating temperature range ³⁾	-40+60°C / -20+60°C to	o -40+140°F/ -4+140°F		
Storage temperature range	-40+100°C to -40 to 212	2°F		
Fluid temperature range 3)	-40+60°C / -20+60°C tr	o -40+140°F / -4+140°F		
(f mark	EN 61000-6-1 / 2 / 3 / 4			
	EN 60079-0 / 11 / 26 / 36			
Vibration resistance to	≤ 20 g			
DIN EN 60068-2-6 at 10500 Hz	Ū.			
Protection class to IEC 60529	IP 65 (for male EN 1753	301-803 (DIN 43650))		
	IP 67 (for M12x1 male, v	when an		
	IP 67 female conn	nector is used)		
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc		
Supply voltage	Ui = 1228 V	12 28 V		
Max. input current	li = 100 mA			
Max. input power	Pi = 1 W	max. power consuption		
Constantion constitution of the constant		≤1W		
Connection capacitance of the sensor	$G_i = \leq 22 \text{ nF}$			
	$L_i = 0 \text{ mH}$	tod overveltage protection		
	EN 61000 6 2	ated overvoltage protection		
Other data	<u>EN 01000-0-2</u>			
Residual ripple of supply voltage	< 5 %			
Life expectancy	> 10 million cycles			
	0 100 % FS			
Weight	~ 180 g			
Note: Reverse polarity protection of the sup provided. FS (Full Scale) = relative to complete B.F.S.L. = Best Fit Straight Line ¹⁾ G1/2 with additional front O-ring se ²⁾ Other seal materials on request ³⁾ d ² E with EDM cost	ply voltage, excess voltage, overrid measuring range al max. 21750 psi	de and short circuit protection a		

4) 500 V AC on request

Areas of application:

		ñ		0	0	2
Code used in Model code	D		9	А	с	
Protection types and applications	Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIIC T85 °C Da	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80 °C T₅₀₀T90 °C Da Ex tb IIIC T80 °C Db	Ex ic IIC T6 Gc Ex ic IIIC T80 °C Dc
Certificate	IECEx KEM 08.0014X					
	Equipment protection level Ma	Equipment protection level Ga, Ga/Gb, Da	Equipment protection level Gb	Equipment protection level Gc	Equipment protection level Da, Db	Equipment protection level Gc, Dc
Zones /	Mining	Gases/conductive dust	Gases	Gases	Conductive dust	Gases/conductive dust
Categories	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: Non-sparking nA	Protection class: Dustproof enclosure	Protection class: Intrinsically safe ic with barrier
Electrical Connection	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da, Ex to IIIC T80/90/100 °C Db and Ex to IIIC T80/90/100 °C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:

EN 17	5301-803 (DIN 43650)
Pin	HDA 47Z5-A
1	Signal +
2	Signal -
3	n.c.
\bot	Housing

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M12x1, 4 pole	



HDA 47Z6-A	
Signal +	
n.c.	
Signal -	
n.c.	
	HDA 47Z6-A Signal + n.c. Signal - n.c.

Model code:

model code.
HDA 4 7 Z X – A – <u>XXXX</u> – <u>XXX</u> – I X X – <u>000</u> (PSI)
Mechanical process
Z = Flush membrane
Electrical connection 5 = Male 3 pole+ PE, EN 175301-803 (DIN 43650) (female connector supplied) 6 = Male M12x1, 4 pole
(female connector not supplied)
Signal
A = 4 20 mA, 2 conductor
Pressure ranges in psi 0500, 0750, 1000, 1500, 3000, 5000, 6000, 9000
Mechanical connection G01 = G1/2 A, DIN 3852 G02 = G1/2 with additional front O-ring seal
Approval I = IECEx
Insulation voltage
Protection types and applications (code) D = Ex ia I Ma Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex ia IIIC T85 °C Da
 9 = Ex nA IIC T6 Gc (only in conjunction with electr. connection "6") * A = Ex ta IIIC T80 °C T₅₀₀T90 °C Da (only in conjunction with electr. conn. "6") * Ex tb IIIC T80 °C Db
C = Ex ic IIC T6 Gc Ex ic IIIC T80 °C Dc
Modification number 000 = Standard
Notes: * For design and electrical connection see Dimensions
Accessories: Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.

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Protection types and applications (code): 9, A



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection. e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part. No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications. For bar ranges see European Catalog

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HYDAC ELECTRONICS

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90 Southland Dr. Bethlehem, PA 18017



Description:

The pressure transmitter HDA 4400 in IECEx Intrinsically Safe version has been especially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version of the HDA 4400, devices with IECEx Intrinsically Safe approval have a field-proven, all-welded stainless steel measurement cell with thin film strain gauge without internal seal.

The pressure connection is achieved with an all-welded stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid.

This device is used for applications in which a standard pressure connection could become blocked, clogged or frozen by the particular medium used. Further applications include processes where the medium changes regularly and any residues could cause mixing or contamination of the media, or in highly viscous media. Intended areas of application are, for example, the oil and gas industry, in mines or in locations with high levIs of dust, e.g. in mills.

Protection types and applications: Ex ia I Ma

Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex nA IIC T6,T5,T4 Gc Ex ic IIC T6, T5, T4 Gc

Ex ta IIIC T80/90/100 °C Da T₅₀₀ 90/100/110 °C Da Ex tb IIIC T80/90/100 °C Db Ex tc IIIC T80/90/100 °C Dc Ex ic IIIC T80/90/100 °C Dc Ex ic IIIC T80/90/100 °C Dc Ex ia IIIC T85 °C Da

Special features:

- Pressure connection has a flush membrane
- Accuracy: ≤ ± 0.5 % BFSL typ. Certificate:
- IECEx KEM 08.0014X
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4400 with Flush Membrane **IECEx Intrinsically Safe IECEx Dustproof Enclosure IECEx Non-sparking**



IEC IEĈEx

Technical data:

Input data	
Measuring ranges	500, 750, 1000, 1500, 3000, 6000, 9000 psi
Overload pressures	1160, 1740, 2900, 2900, 7250, 11600, 14500 psi
Burst pressure ¹⁾	2900, 4350, 7250, 7250, 14500, 29000, 29000 psi
Mechanical connection	G1/2 A DIN 3852
	G1/2 with additional front O-ring seal
	G1/4 with additional front O-ring seal
Pressure transfer fluid	Silicon-free oil
Torque value	33 ft-lb (45 Nm) for G1/2, G1/2A
	15 ft-lb (20 Nm) for G1/4
Parts in contact with medium ²⁾	Stainless steel: 1.4435; 1.4301
	Seal: FPM
	O-ring: FPM
Output data	
Output signal, permitted load resistance	4 20 mA, 2 conductor
	$R_{Lmax} = (U_B - 12 \text{ V}) / 20 \text{ mA} [k\Omega]$
Accuracy to DIN 16086,	≤ ± 0.5 % FS typ.
max. setting	≤ ± 1 % FS max.
Accuracy at minimum setting	≤ ± 0.25 % FS typ.
(B.F.S.L.)	≤ ± 0.5 % FS max.
Temperature compensation	≤ ± 0.0085% FS/°F typ.
Zero point	≤ ± 0.014% FS/°F max.
Temperature compensation	≤ ± 0.0085% FS/°F typ.
Over range	≤ ± 0.014% FS/°F max.
Non-linearity at max. setting	≤ ± 0.3 % FS max.
to DIN 16086	
Hysteresis	≤ ± 0.4 % FS max.
Repeatability	≤±0.1 % FS
Rise time	≤ 1.5 ms
Long term drift	≤ + 0.3 % FS tvp / vear
Environmental conditions	
Compensated temperature range	-1 +185°E
Storage temperature range	-40+212 F
Fluid temperature range ³⁾	-40+140°F / -4+140°F
(E - mark	EN 61000-6-1 / 2 / 3 / 4
	EN 60079-0 / 11 / 26 / 36
Vibration resistance to	≤ 20 g
DIN EN 60068-2-6 at 10500 Hz	
Protection class to IEC 60529	IP 65 (for male EN 175301-803(DIN 43650))
	IP 67 (for M12x1 male, when an
	IP 67 female connector is used)
Relevant data for Ex applications	Ex ia, ic Ex nA, ta, tb, tc
Supply voltage	UI = 1228 V 1228 V
Max. Input current	
Max. Input power	
Connection canacitance of the sensor	$C_{i} = < 22 \text{ nF}$
Inductance of the sensor	$ _{i} = 0 \text{ mH}$
Insulation voltage 4)	50 V AC, with integrated overvoltage protection
	EN 61000-6-2
Other data	
Residual ripple of supply voltage	≤ 5 %
Life expectancy	> 10 million cycles
	0 100 % FS
Weight	~ 180 g
Note: Reverse polarity protection of the supply provided.	y voltage, excess voltage, override and short circuit protection a

FS (Full Scale) = relative to complete measuring range

B.F.S.L. = Best Fit Straight Line

¹ G1/2 with additional front O-ring seal max. 21750 psi
 ²⁾ Other seal materials on request

- ³⁾ -4 °F with FPM seal, -40 °F on request
 ⁴⁾ 500 V AC on request

Areas of application:

Code No. for use in Model code	D		9	А	с	
Protection types and applications	Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIIC T85°C Da	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80°C T ₅₀₀ T90°C Da Ex tb IIIC T80°C Db	Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc
Certificate	IECEx KEM 08.0014X					
	Equipment protection level Ma	Equipment protection level Ga, Ga/Gb, Da	Equipment protection level Gb	Equipment protection level Gc	Equipment protection level Da, Db	Equipment protection level Gc, Dc
Zones /	Mining	Gases/conductive dust	Gases	Gases	Conductive dust	Gases/conductive dust
Categories	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: Non-sparking nA	Protection class: Dustproof enclosure	Protection class: Intrinsically safe ic with barrier
Electrical connection	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in ignition protection class "Dustproof enclosure" for the protection types Ex ta IIIC T80/90/100 °C Da T₅₀₀T90/T100/T110 °C Da, Ex tb IIIC T80/90/100 °C Db and Ex tc IIIC T80/90/100 °C Dc are available with flying leads on request. Devices in the ignition protection class "Non-sparking" for the protection type Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:



M12x1, 4 pole



Pin	HDA 44Z6-A	
1	Signal +	
2	n.c.	
3	Signal -	
4	n.c.	

Model code:

model code.
HDA 4 4 Z X – A – <u>XXXX</u> – <u>XXX</u> – I X X – <u>000</u> (PSI)
Mechanical process
Z = Flush membrane
Electrical connection
5 = Male 3 pole + PE, EN 175301-803 (DIN 43650)
(female connector supplied)
6 = Male M12x1, 4 pole
(female connector not supplied)
Signal
A = 4 20 mA, 2 conductor
Pressure ranges in psi
Mechanical connection
G01 = G1/2 A, DIN 3852 G02 = G1/2 with additional front O-ring seal
G04 = G1/4 with additional front O-ring seal
Approval
I = IECEx
Insulation voltage
N = 50 V AC
Protection types and applications (code)
D = EX ia I Mia
Ex ia IIC T6 Ga/Gb
Ex ia IIC T6 Gb
Ex ia IIIC T85 °C Da
9 = Ex nA IIC T6 Gc (only in conjunction with electr. connection "6")*
A = Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da (only in conjunction with electr.
connection "6")*
C = Exic IIC T6 Cc
Exic life To Ge
Modification number
000 = Standard
Notes:
* For design and electrical connection see Dimensions
Accessories
Appropriate accessories, such as electrical female connectors, can be found in the
Accessories brochure.

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G1/2 A Ø 29 h14 Ø 29.5

Elastomer profile seal ring DIN3869



Protection types and applications (code): 9, A



The impact protected metal safety sleeve is included. A straight female connector is required for electrical connection; e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part. No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described.

For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications. For bar ranges see European Catalog

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HYDAC ELECTRONICS

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Description:

The pressure transmitter HDA 4300 in IECEx Intrinsically Safe version has been especially developed for use in potentially explosive atmospheres and is based on the HDA 4000 series.

As with the industrial version HDA 4300, the devices with IECEx Intrinsically Safe approval have the field-proven ceramic measuring cell with thick-film strain gauge.

The pressure connection is achieved with an all-welded stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid.

This device is used for applications in which a standard pressure connection could become blocked, clogged or frozen by the particular medium used. Further applications include processes where the medium changes regularly and any residues could cause mixing or contamination of the media. Intended areas of application are, for example, the oil and gas industry, in mines, or in locations with high levels of dust, e.g. in mills.

Protection types and applications: Ex ia I Ma

Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex nA IIC T6,T5,T4 Gc Ex ic IIC T6,T5,T4 Gc

Ex ta IIIC T80/90/100 °C Da T 90/100/110 °C Da Ex tb IIIC T80/90/100 °C Db Ex tc IIIC T80/90/100 °C Dc Ex ic IIIC T80/90/100 °C Dc Ex ia IIIC T85 °C Da

Special features:

- Pressure connection has a flush membrane
- Accuracy: $\leq \pm 0.5$ % FS B.F.S.L.
- Certificate: IECEx KEM 08.0014X
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent long-term properties

Electronic Pressure Transmitter HDA 4300 with Flush Membrane **IECEx Intrinsically Safe IECEx Dustproof Enclosure IECEx Non-sparking**



IEC *IEĈE*x

Technical data:

Input data			
Measuring ranges	15, 30, 50, 100, 150, 250, 500 psi		
Overload pressures	45, 100, 150, 290, 450, 725, 1500 psi		
Burst pressure	70, 150, 250, 400, 650, 1000, 2500 psi		
Mechanical connection	G1/2 A DIN 3852 G1/2 with additional front O-ring seal G1/4 with additional front O-ring seal		
Pressure transfer fluid	Silicon-free oil		
Torque value	33 ft-lb (45 Nm) for G1/2, G 15 ft-lb (20 Nm) for G1/4	1/2A	
Parts in contact with medium ¹⁾	Stainless steel:1.44Seal:FPMO-ring:FPM	435; 1.4301 A A	
Output data			
Output signal, permitted load resistance	4 20 mA, 2 conductor R _{Lmax} = (U _B – 12 V) / 20 mA [[kΩ]	
Accuracy to DIN 16086, max. setting	≤ ± 0.5 % FS typ. ≤ ± 1.0 % FS max.		
Accuracy at minimum setting (B.F.S.L.)	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.		
Temperature compensation zero point	≤ ± 0.012% FS/°F typ. ≤ ± 0.017% FS/°F max.		
Temperature compensation over range	≤ ± 0.012% FS/°F typ. ≤ ± 0.017% FS/°F max.		
Non-linearity at max. setting to DIN 16086	≤ ± 0.5 % FS max.		
Hysteresis	≤ ± 0.4 % FS max.		
Repeatability	≤±0.1 % FS		
Rise time	≤ 1.5 ms		
Long term drift	≤ ± 0.3 % FS typ. / year		
Environmental conditions			
Compensated temperature range	-4+185°F		
Operating temperature range	-4+140°F		
Storage temperature range	-40+212°F		
Fluid temperature range 2)	-40+140°F / -4+140°F		
C E mark	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0 / 11 / 26 / 36		
Vibration resistance acc. to DIN EN 60068-2-6 at 10 500 Hz	≤ 20 g		
Protection class to IEC 60529	IP 65 (for male EN 175301 IP 67 (for M12x1 male, wh IP 67 female connect	I-803 (DIN 43650)) ien an stor is used)	
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc	
Supply voltage	Ui = 1228 V	12 28 V	
Max. input current Max. input power	II = 100 mA Pi = 1 W	max. power consuption	
Connection capacitance of the sensor	C _i = ≤ 22 nF		
Inductance of the sensor	$L_i = 0 \text{ mH}$		
Insulation voltage 3)	50 V AC, with integrated ove EN 61000-6-2	ervoltage protection	
Other data	5.0/		
Residual ripple of supply voltage	≤ 5 %		
	10 million cycles 0 100 % FS ~ 180 g		
	- 100 y		
Note: Reverse polarity protection of the supply voltage,	excess voltage, override an	d short circuit protection are	

provided.

- FS (Full Scale) = relative to complete measuring range B.F.S.L. = Best Fit Straight Line
- 1) Other seal materials on request ²⁾ -4 °F with FPM seal, -40 °F on request
 ³⁾ 500 V AC on request

Areas of application:

Code for use in						
Model code		D		9	А	C
Protection types and applications	Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIIC T85°C Da	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80°C T ₅₀₀ T90°C Da Ex tb IIIC T80°C Db	Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc
Certificate	IECEX KEM 08.0014X					
	Equipment protec- tion level Ma	Equipment protection level Ga, Ga/Gb, Da	Equipment protection level Gb	Equipment protection level Gc	Equipment protection level Da, Db	Equipment protection level Gc, Dc
Zones /	Mining	Gases/conductive dust	Gases	Gases	Conductive dust	Gases/conductive dust
Categories	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: intrinsically safe ia with barrier	Protection class: Non-sparking nA	Protection class: Dustproof enclosure	Protection class: Intrinsically safe ic with barrier
Electrical Connection	4, 5, 6	4, 5, 6	4, 5, 6	6	6	4,5,6

Devices in the ignition protection class "Dustproof enclosure" for the protection types Ex ta IIIC T80/90/100° C Da T₅₀₀T90/T100/T110°C Da, Ex tb IIIC T80/90/100°C Db and Ex tc IIIC T80/90/100°C Dc are available with flying leads on request. Devices in the ignition protection class "non-sparking" for protection type Ex nA IIC T6, T5, T4 Gc are available with flying leads on request.

Pin connections:

EN 175301-803 (DIN 43650)			
Pin	HDA 43Z5-A		
1	Signal +		
2	Signal -		
3	n.c.		
\bot	Housing		

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/12x1, 4 pole	
• 4 3 •	

Pin	HDA 43Z6-A	
1	Signal +	
2	n.c.	
3	Signal -	
4	n.c.	

1 2

Model code:

model code.
HDA 4 3 Z X – A – <u>XXXX</u> – <u>XXX</u> – I X X – <u>000</u> (PSI)
Mechanical process connection Z = Flush membrane Electrical connection 5 = Male 3 pole + PE, EN 175301-803 (DIN 43650) (female connector supplied) 6 = Male M12x1, 4 pole
Signal
0015, 0030, 0050, 0100, 0150, 0250, 0500
Mechanical connection G01 = G1/2 A, DIN 3852 G02 = G1/2 with additional front O-ring seal G04 = G1/4 with additional front O-ring seal
Approval
Insulation voltage
N = 50 V AC
Protection types and applications (code) D = Ex ia I Ma Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb Ex ia IIC T6 Gb Ex ia IIIC T85 °C Da
9 = Ex nA IIC T6 Gc (only in conjunction with electr. connection "6")*
A = Ex ta IIIC T80 °C T ₅₀₀ T90 °C Da (only in conjunction with electr. connection "6")* Ex tb IIIC T80 °C Db
C = Ex ic IIC T6 Gc Ex ic IIIC T80 ° <u>C Dc</u>
Modification number 000 = Standard
Notes:
* For design and electrical connection see device dimensions

Accessories:

Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.

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Protection types and applications (code): 9, A



The Impact protected metal safety sleeve is included. A straight female connector is required for electrical connection. e.g. female connector M12x1, 4 pole, straight, with 3m shielded cable: ZBE 06S-03, Part No. 6098243

Note:

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications. For bar ranges see European Catalog

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GYDAD INTERNATIONAL



Description:

The electronic pressure transmitter HDA 4700 with flush membrane is certified in the ignition protection class Flameproof Enclosure to ATEX, IECIx and CSA. The devices have triple approval, ensuring that they are universally suitable for use in potentially explosive environments around the world. Therefore it is no longer necessary to stock multiple devices with separate individual approvals.

The pressure connection is achieved with an all-welded stainless steel front membrane filled internally with a pressure transfer fluid. The process pressure is transmitted hydrostatically to the measurement cell via the pressure transfer fluid.

This device is used for applications in which a standard pressure connection could become blocked, clogged or frozen by the particular medium used. Further applications include processes where the medium changes regularly and any residues could cause mixing or contamination of the media, or in highly viscous media.

Its main applications are in mining and the oil and gas industry, e.g. in underground vehicles, hydraulic power units (HPU), blow-out preventers (BOPs), drill drives or in lubrication systems.

Protection types and applications:

 ^cCSA_{US} Explosion Proof – Seal Not Required Class I Group A, B, C, D, T6, T5 Class II Group E, F, G Class III Type 4
 ATEX Flame Proof

 IM2 Ex d I Mb
 II 2G Ex d IIC T6, T5 Gb
 II 2D Ex tb IIIC T110 .. 130 °C Db

IECEx Flame Proof Ex d I Mb Ex d IIC T6, T5 Gb Ex tb IIIC T110 .. 130 °C Db

Special features:

- Accuracy ≤ 0.25 % FS B.F.S.L.
 Certificates: ATEX KEMA 10ATEX0100 X CSA MC 224264 IECEx KEM 10.0053X
- Robust design
- Very small temperature error
- Excellent EMC characteristics
- Excellent durability

Electronic Pressure Transmitter HDA 4700 with Flush Membrane ATEX, IECEx, CSA Flameproof Enclosure





Input data	
Measuring ranges	500, 750, 1000, 1500, 3000, 6000, 9000 psi
Overload ranges	1160, 1740, 2900, 2900, 7250, 11600, 14500 psi
Burst pressure	2900, 4350, 7250, 7250, 14500, 29000, 29000 psi
Mechanical connection ¹⁾	G1/2 A DIN 3852 G1/2 with add. front O-ring seal
Pressure transfer fluid	Silicon-free oil
Torque value	33 ft-lb (45 Nm)
Parts in contact with medium	Stainless steel: 1.4435; 1.4301 Seal: FPM O-ring: FPM
Conduit, housing material	1.4404: 1.4435 (316L)
Output data	
Output signal, permitted load resistance ²⁾	420 mA, 2 conductor R _{Lmax} = (U ₈ – 8 V) / 20 mA [kΩ]
Accuracy to DIN 16086, max. setting	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.
Accuracy at minimum setting (B.F.S.L.)	≤ ± 0.15 % FS typ. ≤ ± 0.25 % FS max.
Temperature compensation	$\leq \pm 0.0045\%$ FS/°F typ. $\leq \pm 0.0085\%$ FS/°F max
Temperature compensation	$\leq \pm 0.0045\%$ FS/°F typ. $\leq \pm 0.0085\%$ FS/°F max
Non-linearity at max. setting to DIN 16086	$\leq \pm 0.3$ % FS max.
Hysteresis	≤ ± 0.1 % FS max.
Repeatability	≤ ± 0.05 % FS
Rise time	≤ 1.5 ms
Long term drift	≤ + 0 1 % ES typ / year
Environmental conditions	
Compensated temperature range	T5: -13+176°F T6: -13+140°F
Operating temperature range ³⁾	T5: -40+176°F T6: -40+140°F
	-40+212°F
Fluid temperature range ³⁾	T5: -40+176°F T6: -40+140°F
(€ mark	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0 / 1 / 31
Vibration resistance to DIN EN 60068-2-6 at 10500 Hz	≤ 20 g
Protection class to IEC 60529 to ISO 20653	IP 65 (Vented Gauge) IP 69K(Sealed Gauge)
Other data	
Supply voltage	8 30 V DC
Residual ripple of supply voltage	≤ 5 %
Life expectancy	> 10 million load cycles, 0 100 % FS
Weight	~300 g
 Note.: Reverse polarity protection of the supply volta and short circuit protection are provided. FS (Full Scale) = relative to complete measure B.F.S.L. = Best Fit Straight Line Other mechanical connections on request Other output signals on request -4 °F with FPM seal , -40 °F on request 	age, excess voltage, override ring range

Pin connections:

Conduit (single cores)



Core	HDA 47Z9-A
red	Signal +
black	Signal -
green- vellow	Housing

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Conduit (flying leads) HDA 47ZG-A Core Signal white brown Signal + green n.c. yellow n.c.

Areas of application:

Approvals	cCSAus: Explosion Proof - Seal not required ATEX: Flame Proof IECEx: Flame Proof
Certificate	ATEX KEMA 10ATEX100X CSA MC 224264 IECEx KEM 10.0053X
Applications / Protection types	c CSA us: Class I Group A, B, C, D, T6; T5 Class II Group E, F, G Class III Type 4
	ATEX: I M2 Ex d I Mb II 2G Ex d IIC T6, T5 Gb II 2D Ex tb IIIC T110 130 °C Db
	IECEx: Ex d I Mb Ex d IIC T6, T5 Gb Ex tb IIIC T110 130 °C Db
Model code: HDA 4 7 Z X – A	Ą – <u>XXXX – XXX</u> – D X – <u>000</u> (PSI) (<u>72in</u>)

HDA 4 7 Z X – A – <u>XXXX</u> – <u>XXX</u> – D X – <u>000</u> (PSI) (<u>72in</u>
Mechanical process connection Z = Flush membrane
Electrical connection 9 = 1/2-14 NPT Conduit (male thread), single cores G = 1/2-14 NPT Conduit (male thread), flying leads
Signal
A = 4 20 mA, 2 conductor
Pressure ranges in psi
Mechanical connection G01 = G1/2 A, DIN 3852 G02 = G1/2 with additional front O-ring seal
Approval
D = CSA Explosion Proof – Seal not required ATEX Flame Proof IECEx Flame Proof
Type of measurement cellS = Sealed Gauge (sealed to atmosphere) ≥ 500 psiV = Vented Gauge (vented to atmosphere) ≤ 300 psi
Modification number 000 = Standard

Cable length in inches -Standard = 72 inches

Accessories:

Appropriate accessories, such as electrical female connectors, can be found in the Accessories brochure.





* optional, depending on gauge type "Sealed Gauge" / "Vented Gauge"

Note:

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions

not described, please contact the relevant technical department. Subject to technical modifications.

For bar ranges see European Catalog

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EYDAD INTERNATIONAL



Description:

The HYDAC HFS 2100 flow switch in ATEX version has been specially developed for use in potentially explosive atmospheres. Like the standard version it is based on the variable area float principle, and can be mounted in any position.

The test medium moves a spring-loaded float in the direction of flow, depending on the flow rate. A fully encapsulated reed contact is fitted to the outside of the instrument and is therefore separate from the flow circuit. When the magnet inside the float reaches the preset position, the reed contact switches.

Intended areas of application are, for example, the oil and gas industry, on gas turbines or in locations with high levels of dust contamination, e.g. in mills.

Protection types and applications:

- II 2G Ex mb II T6/T5
- II 2D Ex tD A21 IP67 T80 °C / T100 °C

Medium:

Oils / viscous fluids

Special features:

- Accuracy ≤ ± 10 % FS
- Viscosity compensation from 30 .. 600 cSt
- Any mounting position
- High level of functional reliability
- High level of switching accuracy
- Stepless switch point setting by user
- High pressure resistance
- Threaded connection
- Certificate: PTB 03 ATEX 2159 X PTB 03 ATEX N056-3

Electro-Mechanical Flow Switch HFS 2100 ATEX Encapsulation for Oils / Viscous Fluids



Technical data:

Input data				
Switching ranges [l/min]	Size 1	Size 2		
	0.5 1.6	0.5 1.5		
	0.8 3.0	1 4		
	2.0 7.0	28		
		3 10		
		5 15		
		8 24		
		10 30		
		15 45		
		20 60		
		30 90		
		35 110		
Operating pressure				
Brass version	300 bar	250 bar		
Stainless steel version	350 bar	300 bar		
Pressure drop	0.02 0.2 bar	0.02 0.4 bar		
Mechanical connection	See dimensions			
Parts in contact with medium				
Brass version	St. steel 1 4571: FPM ¹⁾ h	rass nickel-nl · brass· hard		
	ferrite			
Stainless steel version	Stainless steel 1.4571: FF	PM ¹⁾ : hard ferrite		
Output data	,	,		
Switching outputs	1 or 2 Reed contacts			
	Change-over or normally open type $^{2)}$			
Bonostability	2 % ES max			
Switching capacity	2 /0 I S IIIdx.			
Change over contact	may 250 \//1 A / 20 \//			
Change-over contact	Back-up fuse 1 A (outside	the hazardous area)		
N/O contact	max. 250 V / 2 A / 60 W			
	Back-up fuse 2 A (outside	the hazardous area)		
Environmental conditions				
Operating temperature range	T6 / T80 °C: -20 +7	75 °C 00 °C		
Fluid temperature range	T6 / T80 °C: -20 +7	25 °C		
	T5 / T100 °C: -20 +9	0°0		
Max. surface temperature	T6 / T80 °C: +75 °C			
	T5 / T100 °C: +90 °C			
Viscosity range	30 600 cSt			
CE - mark	Directive 2006 / 95 / EC			
	Directive 2004 / 108 / EC			
	EN 60079-0:2006 / EN 60079-18:2004			
	EN 61241-0:2006 / EN 61	241-1:2004		
Protection class to IEC 60529	IP 67			
Other data				
Housing material	Brass (nickel-plated) or st	ainless steel 1.4571		
Electrical connection	Flying leads (2 m cable length)			
Note : ES (Full Scale) - relative to the		· · ·		
1) Other seal materials available	1) Other seal materials available on request			

²⁾ The contact opens / switches when the flow falls below the pre-set switching point.

³⁾ 3% possible with calibration to a certain viscosity

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Pin assignment: Flying leads

Core	HFS 21X1-XS	HFS 21X1-XW
1		Centre
2	N/O contact	N/C contact
3		N/O contact

Notes on installation:

- The medium must not contain solid particles! We recommend using contamination strainers.
- External magnetic fields can affect the switching contact. Ensure sufficient distance from magnetic fields (e.g. from electric motors)!

Safety instructions:

- The circuits must not incorporate any effective inductance or capacitance.
- The maximum ratings stipulated in the technical data must never be exceeded, not even for a short time.
- To protect the switching contact, a fuse for the circuit must be provided outside the hazardous area, unless the switching unit is connected to an intrinsically safe circuit.
- Unless the device is connected to an intrinsic safe circuit, special safety precautions have to be implemented.
- The device may be used in hazardous areas designated as category 2.
- The device must not be used in areas where there is a possibility that an electrostatic charge can be caused in the plastic housing.
- The device must not be used in machinery, systems or medical apparatus where, in the event of a malfunction, persons, animals or equipment could be harmed or damaged.

Model code:

Measuring principle
Test medium
Mechanical connection $^{4)}$ $^{6)}$ 1 = 1/4 " 2 = 3/8 " 3 = 1/2 " 4 = 3/4 " 5 = 1 "
Electrical connection 1 = Flying leads (2m in length)
Switching contacts ⁵ 1S = 1 N/O contact 2S = 2 N/O contacts 1W = 1 Change-over contact 2W = 2 Change-over contacts
Switching ranges in I/min ⁶⁾ Oil 10 % -Size 1- 00.5-01.6; 00.8-03.0; 02.0-07.0
Oil 10 % - Size 2- 00.5-01.5; 0001-0004; 0002-0008; 0003-0010; 0005-0015; 0008-0024; 0010-0030; 0015-0045; 0020-0060; 0030-0090; 0035-0110
Accuracy $7 = \le 10.0 \% \text{ FS}$
Housing material B = Brass (nickel-plated) S = Stainless steel
Mechanical indicator 0 = Without indicator 1 = With indicator
Modification number A00 = ATEX version for potentially explosive areas

HES 2 1 X 1 - XX - XXXX - XXXX - 7 - X - X - $\Delta 00$

- ⁴⁾ Mechanical connection options depend on housing type (see Dimensions).
- ⁵⁾ When the model with 2 switching contacts is selected, the second contact is mounted on the side of the instrument, at 90° to the first contact.
- ⁶⁾ Other models available on request.

Accessories:

Appropriate accessories, such as electrical connectors can be found in the Accessories brochure.

Dimensions without indicator:

OIL -Size 1- without indicator

Type [l/min]	Installation dimensions [mm]				Weight (approx.) [g]
	DN	SW	G	L	
0.5 1.6	8 10 15	24 24 27	1/4" 3/8" 1/2" ^{*)}	98 119 90	450 500 400
0.8 3.0	15	27	1/2"	90	400

*) Standard







OIL -Size 2- without indicator

Type [l/min]	Installation dimensions					Weight (approx.) [g]	
	DN	SW	G	L	Т		
0.5 1.5	8 15 20 25	34 34 34 40	1/4" 1/2" 3/4" 1" ^{*)}	152 152 152 130	10 14 15 17	1500 1425 1340 1160	
2 8	15 20 25						
3 10		34 34 40	1/2" 3/4" 1" ^{*)}	152 152 130	14 15 17	1425	
5 15						1160	
8 24							
10 30			0/4	450	4-	4040	
15 45	20 25	34	3/4" 1" *)	152	15 17	1340	
20 60		70		100		1100	
30 90	25	10	1"	130	17	1160	
35 110		40	1	130	17	1100	

*) Standard







Dimensions with indicator:

OIL -Size 1- with indicator

Туре	Installati	Weight				
[l/min]	[mm]	[g]				
	DN	SW	G	L		
0.5 1.6						
0.8 3.0	15	30	1/2"	90	570	
2.0 7.0						









OIL -Size 2- with indicator

Type	Installation dimensions					Weight (approx.) [g]
	DN	SW	G	L	Т	101
0.5 1.5	8 15 20 25	34 34 34 40	1/4" 1/2" 3/4" 1" ^{*)}	152 152 152 130	10 14 15 17	1590 1515 1430 1250
2 8 3 10 5 15 8 24	15 20 25	34 34 40	1/2" 3/4" 1" ^{*)}	152 152 130	14 15 17	1515 1430 1250
10 30 15 45 20 60	20 25	34 40	3/4" 1" *)	152 130	15 17	1430 1250
30 90 35 110	25	40	1"	130	17	1250

*) Standard









Note:

The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

HYDAC ELECTRONICS

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GYDAD INTERNATIONAL



Description:

The HYDAC HFS 2500 flow switch in ATEX version has been specially developed for use in potentially explosive atmospheres. Like the standard version it is based on the variable area float principle, and can be mounted in any position.

The test medium deflects a springloaded float in the direction of flow, depending on the flow rate. A fully encapsulated reed contact is fitted to the outside of the device and is therefore separate from the flow circuit. When the magnet inside the float reaches the preset position, the reed contact switches.

Intended areas of application are, for example, the oil and gas industry, on gas turbines or in locations with high levels of dust, e.g. in mills.

Protection types and applications:

- II 2G Ex mb II T6/T5
- II 2D Ex tD A21 IP67 T80 °C / T100 °C

Medium:

- Water / water-based media
- **Special features:**
- Accuracy $\leq \pm 5$ % or $\leq \pm 10$ % FS
- Any mounting position
- High level of functional reliability
- High level of switching accuracy
- Stepless switch point setting by user
- High pressure resistance
- Threaded connection
- Certificate:
 PTB 03 ATEX 2159 X
 PTB 03 ATEX N056-3

Electro-Mechanical Flow Switch

HFS 2500 ATEX Encapsulation for Water or Water-based Media

$\langle x 3 \rangle$

Technical data:

Input data						
Switching ranges [l/min]	5 % accurac	5 % accuracy		10 % accuracy		
			Size 2	Size 3		
	0.2 4.0	8 90	0.02 0.2	10 30		
	0.6 5.0	5 110	0.2 0.6	15 45		
	0.5 8.0	10 150	0.4 1.8	20 60		
	1 14	35 220	0.8 3.2	30 90		
	1 28	35 250	27	60 150		
	240		313			
	4 55		4 20			
	1 70		830			
Operating pressure						
Brass version	200 bar		300 bar	250 bar		
Stainless steel version	300 bar		350 bar	300 bar		
Pressure drop [bar]	0.02 0.8		0.02 0.3	0.02 0.4		
Mechanical connection	See dimensio	ons		·		
Parts in contact with medium Brass version Stainless steel version	Stainless stee Stainless stee	el 1.4571; NBR ¹⁾ ; I el 1.4571; FPM ¹⁾ ; I	Brass; nickel-plate Hard ferrite	d; Brass; Hard ferrite		
Output data						
Switching outputs	1 or 2 reed contacts Change-over or normally open type ²⁾					
Accuracy	$\leq \pm 5\% \text{ or } \leq \pm 10\% \text{ FS}$					
Repeatability	2 % FS max.					
Switching capacity						
Change-over contact	max. 250 V / Back-up fuse	1 A / 30 W 1 A (outside the h	azardous area)			
N/O contact	max. 250 V / 2 A / 60 W Back-up fuse 2 A (outside the hazardous area)					
Environmental conditions						
Operating temperature range	T6 / T80 °C:		-20 +75 °C			
Fluid temperature range	T6 / T80 °C:		-20 +90 °C			
M	T5 / T100 °C:		-20 +90 °C	_		
Max. surface temperature	T5 / T100 °C:		+75 °C +90 °C			
C E mark	Directive 2006 / 95 / EC Directive 2004 / 108 / EC Directive 94 / 9 / EC EN 60079-0:2006 / EN 60079-18:2004 EN 61241-0:2006 / EN 61241-1:2004					
	EN 61241-0:2	2006 / EN 61241-1	1:2004			
Protection class to IEC 60529	EN 61241-0:2	2006 / EN 61241-1	1:2004			
Protection class to IEC 60529 Other data	EN 60079-0.2 EN 61241-0:2	2006 / EN 61241-1	1:2004			
Protection class to IEC 60529 Other data Housing material	EN 60079-0.2 EN 61241-0:2 IP 67 Brass (nickel	-plated) or stainles	ss steel 1.4571			

²⁾ The contact opens / switches when the flow falls below the pre-set switching point.

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Model code:
HFS 25X1-XX-XXXX-XXXX-X - X - X - X - A00
Measuring principle 2 = Variable area float Test medium 5 = Water or water-based
Mechanical connection $^{3)5)}$ 1 = 1/4 " 2 = 3/8 " 3 = 1/2 " 4 = 3/4 " 5 = 1 " 6 = 1 1/4 " 7 = 1 1/2 " Electrical connection
1 = Flying leads (2m in length)
Switching contacts ⁴⁾ 1S = 1 N/O contact 2S = 2 N/O contacts 1W= 1 Change-over contact 2W= 2 Change-over contacts
Switching ranges in I/min ⁵⁾
Water 5 % 00.2-04.0; 00.6-05.0; 00.5-08.0; 01.0-0014; 01.0-0028; 02.0-0040; 04.0-0055; 01.0-0070; 08.0-0090; 0005-0110; 0010-0150; 0035-0220; 0035-0250;
Water 10 % -Size 2-
0.02-00.2; 00.2-00.6; 00.4-01.8; 00.8-03.2; 02.0-07.0; 03.0-0013; 04.0-0020; 08.0-0030
Water 10 % - Size 3 -
0010-0030; 0015-0045; 0020-0060; 0030-0090; 0060-0150
6 = 5.0% FS 7 = 510.0% FS
Housing material B = Brass, nickel-plated S = Stainless steel
Mechanical indicator
0 = Without indicator 1 = With indicator
Modification number
A00 = ATEX version for potentially explosive areas
 Mechanical connection options depend on housing type (see Dimensions)
 When the model with 2 switching contacts is selected, the second switching contact is mounted on the side of the instrument, at 90° to the first contact.
5) Other models available on request.

Accessories:

Appropriate accessories, such as electrical connectors, can be found in the Accessories brochure.

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Pin connections:

Flying leads

7 5 ****							
Pin	HFS 25X1-XS	HFS 25X1-XW					
1	N/O contact	Centre					
2		N/C contact					
3		N/O contact					

Notes on installation:

- The medium must not contain solid particles! We recommend using contamination strainers.
- External magnetic fields can affect the switching contact.
 Ensure sufficient distance from magnetic fields (e.g. from electric motors)!

Safety instructions:

- The circuits must not incorporate any effective inductance or capacities.
- The maximum ratings stipulated in the technical data must never be exceeded, even for a short time.
- To protect the switching contact, a fuse for the circuit must be provided outside the hazardous area, unless the switching unit is connected to an intrinsically safe circuit.
- Unless the device is connected to an intrinsic safe circuit, special safety precautions have to be implemented.
- The device may be used in hazardous areas designated as category 2.
- The device must not be used in areas where an electrical charge in the plastic housing is likely.
- The device must not be used in machinery, systems or medical apparatus where, in the event of a malfunction, persons, animals or equipment could be harmed or damaged.
Dimensions without indicator:

Type	Instal	Weight (approx.)						
[]	[[]							[9]
	SW	D	В	G	DN	Т	L	

Water 5 % accuracy

0.2 4.0								
0.6 5.0				1/4"	8			
0.5 8.0	27	30	53	3/8"	10	14	131	850
1 14				1/2"	15			
1 28								
2 40	27	30	53	1/2"	15	14	146	000
455	32	35	55	3/4"	20	16	174	900
1 70								
890	34 40	40	63	3/4" 1"	20	18	152	1400
5 110					20			1100
10 150	50	50	73	1 1/4"	32	21	200	2750
35 220	50	50	73	1 1/4"	32	21	200	3000
35 250	60	60	78	1 1/2"	40	24	200	3800







Water 10 % Accuracy - Size 2-

0.02 0.2								
0.2 0.6								
0.4 1.8								
0.8 3.2	27	21	67	1/2 "	15	15	00	400
2.0 7.0	27	51	07	172	15		90	400
3.0 13.0								
4.0 20.0	1							
8.0 30.0								



Water 10 % Accuracy - Size 3-

10 30	34	47	93	3/4 " 1" ^{*)}		21 17	152 130	1200 1050
15 45					20 25			
20 60								
30 90								
60 150	41	47	93	1"	25	17	130	1050

*) Standard



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Dimensions with indicator:

Туре	Instal	Weight								
[l/min]	[mm]	[mm]								
	SW	D	В	G	DN	Т	L			

Water 5 % accuracy

0.2 4.0								
0.6 5.0				1/4"	8			940
0.5 8.0	27	30	53	3/8"	10 15	14	131	
1 14								
1 28								
240	27	30	52	1/2"	15	14	146	000
4 55	32	35	55	3/4"	20	16	174	
1 70								
890	34 40	40	63	3/4"	20	18 19	152	1490
5 110					20		100	
10 150	50	50	73	1 1/4"	32	21	200	2840
35 220	50	50	73	1 1/4"	32	21	200	3090
35 250	60	60	78	1 1/2"	40	24	200	3890





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Water 10 % Accuracy - Size 2-

0.02 0.2								
0.2 0.6								
0.4 1.8								
0.8 3.2	30	30	70	1/2 "	15	15	00	570
2.0 7.0	30	30	70	1/2	15	15	90	570
3.0 13.0								
4.0 20.0								
8.0 30.0								





Water 10 % Accuracy - Size 3-

10 30	34		93 ^{3/4} " 1" ^{•)} "					
15 45		10		3/4 " 1" ^{*)}	20 25	15 17	152 130	1430 1250
20 60	40	40						
30 90								
60 150	40	40	93	1"	25	17	130	1250







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JS 18.394.1/10.17 The information in this brochure relates to the operating conditions and applications described. For applications and operating conditions not described, please contact the relevant technical department. Subject to technical modifications.

Note:

*) Standard

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INTERNATIONAL



Description:

HFT 3100 with HART interface is a compact flow rate transmitter with flameproof enclosure specially developed for applications in hydraulic systems and other fluid power systems.

The triple approval in accordance with ATEX, IECEx and CSA enables universal, world-wide utilisation of the devices in potentially explosive atmospheres.

HFT 3100 operates in accordance with the turbine principle, which means that the rpm of an impeller wheel rotating in the flow of the media is recorded and converted into a 4 .. 20 mA analogue signal. In addition with the analogue output of the measured value, digital communication is possible by means of the HART protocol.

Two additional SAE 6 threaded bore holes in the turbine housing provide the flow rate transmitter with additional connection options, e.g. for temperature and pressure sensors.

Protection types and applications

_C CSA _{US}	Explosion Proof - seal not required					
	Class I Group A, B, C, D, T6, T5					
	Class II Group E, F, G					
	Class III					
	Type 4					
ATEX FI	ame Proof					
	I M2 Ex d I Mb					
	II 2G Ex d IIC T6, T5 Gb					
	II 2D Ex tb IIIC T110 120 °C Db					
IECEx F	lame Proof					
	Ex d I Mb					
	Ex d IIC T6, T5 Gb					
	Ex tb IIIC T110 120 ℃ Db					

Flow Rate Transmitter HFT 3100

ATEX, IECEx, CSA Flameproof enclosure with **HART** Interface





Technical data:

Input data	
Measuring ranges and operating	pressure
HFT 31XX- F21-0020	0.32 5.28 gpm 6090 psi
HFT 31XX- F21-0060	1.59 15.85 gpm 6090psi
HFT 31XX- F21-0300	3.96 79.25 gpm 6090 psi
HFT 31XX- F21-0600	10.57 158.5 gpm 6090psi
Additional connection options ¹⁾	2 x SAE 6 female threads for pressure or temperature sensors
Parts in contact with fluid	Stainless steel: 316L, 329, tungsten carbide
Output data	
Output signal, permitted load	420 mA, 2 conduits, with HART Protocol
resistance	$R_{Lmax}=(U_B - 12 V) / 20 mA [k\Omega]$
	for HART communikation min. 250 Ω
HART Communication	according to HART 7 specification
HART Common Practice	Altering of measuring range limits (see table)
Commands i.e.	
Accuracy	\leq 2 % of the actual value
Ambient conditions	
Compensated temperature range	-40 +158°F
Operating/ Ambient temperature range	⁵ T6, T110 Ta = -40 140 °F T5 Ta = -40 158 °F
Storage temperature range	-40 +212 ℉
Fluid temperature range ²⁾	T6, T110 Ta = -40 140 °F T5 Ta = -40 158 °F
€ - mark	EN 61000-6-1, EN 61000-6-2 EN 61000-6-3, EN 61000-6-4
Vibration resistance to	10g
Protection class to IEC 60529	
ISO 20653	IP 6K9K
Other data	
Measuring medium	hydraulic fluids. water-based media
Viscosity range	1 100 cSt
Calibration viscosity	30 cSt
Supply voltage	12 30 VDC
Residual ripple of supply voltage	46 bis 125 Hz: < 0.2 Vpp > 125 Hz < 1.2 mVRMS
Current consumption	≤ 25mA
Weight:	
HFT 318X- F21-0020, SAE 8	approx. 2.5 kg
HFT 319X- F21-0060, SAE 14	approx. 4.0 kg
HFT 31AX- F21-0300, SAE 20	approx. 5.5 kg
HFT 31BX- F21-0600, SAE 24	approx. 7.0 kg

Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided. ¹⁾ not for measuring range: 0.32 ... 5.28 gpm

 $^{2)}$ T120 °C at Ta = -40 ... +158 °F with electrical connection single leads available

Measuring Range Limits: By means of HART Common Practice Commands, you have the opportunity to adjust the following measuring ranges:

	Lower measuring range limit		Upper measu	ring range limit	Measuring range	
	min	max	min	max	min	max
HFT 3100	0 % FS	75 % FS	25% FS	100 % FS	25% FS	100 % FS

Areas of applications:

Single leads Electrical connection "9"	Jacketed cable Electrical connection "G"							
Explosion Proof - seal not required								
Flame Proof								
Class I Group A, B, C, D, T6, T5								
Class II Gro	up E, F, G							
Class III								
Туре 4								
IM2 Exc	d Mb							
ll 2G Ex c	I IIC T6, T5 Gb							
II 2D Ex tb IIIC T110120 °C Db	II 2D Ex tb IIIC T110 ℃ Db							
Ex d	Ex d I Mb							
Ex d	Ex d IIC T6. T5 Gb							
Ex tb IIIC T110120 °C Db	Ex tb IIIC T110 °C Db							
	Single leads Electrical connection "9" Explosion Proof - Flame Class I Gro Class II Class I Class I Clas I Class I C							

Dimensions:







Pin connections:

Conduit (single leads)



Lead	HFT 31x9
red	Signal +
black	Signal -
green-yellow	Housing

Conduit (jacketed cable)



Lead	HFT 31xG
white	Signal -
brown	Signal +
Green	n.c.
yellow	n.c.

Without threaded holes for temperature and pressure sensors:

Model	Measurement range	L	Н	D/SW	G	Tightening torque	DN
HFT 31XX-F21-0020	0.32 5.28 gpm	117 mm	158 mm	60 / 56 mm	SAE 8 (3/4 -16 UNF 2B)	60 Nm	7 mm

With threaded holes for temperature and pressure sensors:

Model	Measurement range	L	н	D/SW	G	Tightening torque	DN	Thread
HFT 31XX- F21-0060	1.59 15.85 gpm	144 mm	160 mm	63 / 60 mm	SAE 14 (1 3/16 -12 UN 2B)	140 Nm	11 mm	SAE 6
HFT 31XX- F21-0300	3.96 79.25 gpm	155 mm	173 mm	75.5 / 72 mm	SAE 20 (1 5/8 -12 UN 2B)	290 Nm	22 mm	SAE 6
HFT 31XX- F21-0600	10.57158.5 gpm	181mm	178 mm	81/76 mm	SAE 24 (1 7/8 -12 UN 2B)	325 Nm	30 mm	SAE 6

HFT 31 X X - F21 - XXXX - S- X - D - 000 (72")

Mechanical Process Connection — 8 = 3/4 -16 UNF 2B (SAE8 female) only for mr: 1.2 .. 20 l/min 9 = 1 3/16 -12 UN 2B (SAE14 female) only for mr: 6 .. 60 l/min H = 1 5/8 -12 UN 2B (SAE 20 female)

only for mr: 15 ... 300 l/min B = 1 7/8 -12 UN 2B (SAE24 female) only for mr: 40 ... 600 l/min

Electrical connection

Model code:

9 = 1/2-14 NPT Conduit (male thread), single leads G = 1/2-14 NPT Conduit (male thread), jacketed cable

Signal

F21 = 4 .. 20 mA (with HART Interface)

Measuring ranges

0020 = 0.32 .. 5.28 gpm 0060 = 1.59 .. 15.85 gpm 0300 = 3.96 .. 79.25 gpm 0600 = 10.57 .. 158.5 gpm

Housing material

S =Stainless steel

Housing design

1 = without threaded bore (measuring ranges 0020)

3 = with two additional female threads 9/16-18 UNF 2B (SAE 6), (measuring ranges (0060, 0300, 0600)

Approval

D = **CSA** Explosion Proof (seal not required) **ATEX** Flame Proof **IECEx** Flame Proof

Modification number -

000 = standard

Cable length in inch

Standard = 72 inch

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department. For applications or operating conditions not described please contact the relevant technical department.

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HYDAC ELECTRONICS

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(HYDAD) INTERNATIONAL



Description:

HFT 3100 with HART interface is a compact flow rate transmitter with intrinsically safe specially developed for applications in hydraulic systems and other fluid power systems. The double approval in accordance with ATEX and IECEx enables universal, almost world-wide utilisation of the devices in potentially explosive atmospheres.

The current flow is determined by means of a sensor according to the turbine principle In addition with the analogue 4-20 mA output of the measured value, digital communication is possible by means of the HART protocol.

The main fields of application are in the oil & gas industry, gas turbines. The device is also used in mining applications as well as in areas with high dust loads.

Two additional threaded bore holes in the turbine housing provide the flow rate transmitter with additional connection options, e.g. for temperature and pressure sensors.

Protection types and applications

ATEX	M1 1G 1/2 G 2 G 1D 1D	Ex ia I Ma Ex ia IIC T6,T5 Ga Ex ia IIC T6,T5 Ga/Gb Ex ia IIC T6,T5 Gb Ex ia IIC T6,T5 Gb Ex ia IIIC T85°C/T95°C Da Ex ia IIIC T80/90/100°C
	2D 3G 3G 3D 3D	T ₅₀₀ T90/T ₅₀₀ T100/T ₅₀₀ T110℃Da Ex tb IIIC T80/T90/T100℃Db Ex nA IIC T6, T5, T4 Gc Ex ic IIC T6, T5, T4 Gc Ex tc IIIC T80/T90/T100℃Dc Ex ic IIIC T80/T90/T100℃Dc
IECEx		Ex ia I Ma Ex ia IIC T6,T5 Ga Ex ia IIC T6,T5 Ga/Gb Ex ia IIC T6,T5 Gb Ex ia IIC T8,T5 Gb Ex ia IIIC T80/T90/T100 $^{\circ}$ Da Ex ta IIIC T80/T90/T100 $^{\circ}$ Da Ex tb IIIC T80/T90/T100 $^{\circ}$ Db Ex nA IIC T6,T5,T4 Gc Ex ic IIC T60/T90/T100 $^{\circ}$ Dc Ex tc IIIC T80/T90/T100 $^{\circ}$ Dc Ex tc IIIC T80/T90/T100 $^{\circ}$ Dc Ex ic IIIC T80/T90/T100 $^{\circ}$ Dc

Flow Rate Transmitter HFT 3100

ATEX, IECEx Intrinsically safe Dustproof housing Non-sparking With **HART** Interface





Technical Details

Input data		
Measuring range and operating pressure		
HFT 31XX- F21-0020	0.32 5.28 g	pm 6090psi
HFT 31XX- F21-0060	1.59 15.85 0	pm 6090psi
HFT 31XX- F21-0300	3.96 79.25 (100 psi
HFT 311X- F21-0600	10.57 158.5	apm 6090 psi
Additional connection options ¹⁾	2 x SAE6 fema	e threads for pressure or temperature
	sensors with re	evant approvals
Parts in contact with fluid	Stainless steel:	316L, 329, tungsten carbid
output data		
Output signal, max. load resistance	420 mA, 2 co	nductor, with HART Protocol
	$R_{Imax} = (U_B - 12)$	V) / 20 mA [kΩ]
	With HART con	nmunication min. 250 Ω
HABT Communication	According to H	ABT 7 specifications
HART Common Practice Commands i a	Altering of moseur	
	< 2 % of the act	
Ambient conditions		עמו ימוטל
Compensated temperature range	-10 15005	
Operating temperature range	T6 T80 T859	T ₂₀₀ 90: Ta − -13 140 °F
operating temperature range	T5, T90, T95 ℃	T_{500} 100: Ta = -13 158°F
	T100, T ₅₀₀ 110 :	Ta = -13 176°F
	T4 :	Ta = -13 185 ⁰F
Storage temperature range	-40 +212 ℉	
Fluid temperature range	T6, T80, T85℃,	T ₅₀₀ 90: Ta = -13 140 °F
	T5, T90, T95℃,	T ₅₀₀ 100: Ta = −13 158°F
	1100, 1 ₅₀₀ 110 :	la = -13 176°⊢
(f. mode	14:	1a = -13 185°F
CC-mark	EN 61000-6-1/-2	2/-3/-4, EN 61079-0/11/15/26/31,
Vibration resistance to	10 g	
DIN EN 60068-2-6 at 10 500Hz	, s g	
Protection class to IEC 60529	IP 67	
Relevant data for Ex-applications	Ex ia, ic	Ex nA, ta, tb, tc
Supply voltage	Ui = 12 28 V	12 28 V
Max. input current	li = 100 mA	
Maximum input power	Pi = 0.7W	Max. power consuption < 1W
Connection capacitance of the sensor	C _i = ≤ 22 nF	
Inductance of the sensor	$L_i = 0 \text{ mH}$	
Isolation voltage	50 V AC with in	tegrated overvoltage protection according
	to EN 61000-6-	2
Other data		
Residual ripple of supply voltage	46 to 125 Hz <	0.2 Vpp
	> 125 Hz:	<1.2 mvRMS
Current consumption	≤ 25 mA	
Measuring medium	Hydraulic oil, w	ater based fluid
Viscosity range	1 100 cSt	
Calibration viscosity	30 cSt	
Weight:		
HFT 311X-F21-0020	2.5 kg	
HEI 311X- F21-0060	4.0 kg	
HF1 311X- F21-0300	5./ Kg	
	7.0 Kg	

Note: Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection are provided.

¹⁾ not available for size 1.2 .. 20 l/min

Measuring Range Limits:

By means of HART Common Practice Commands, you have the opportunity to adjust the following measuring ranges:

Lower measuring range limit		Upper measuring rang	je limit	Measuring range		
min	max	min	max	min	max	
0 % FS	75 % FS	25% FS	100 % FS	25% FS	100 % FS	

Applications:

Code for use in model code		1		9	А	С
ATEX DEKRA 13ATEX0031X DEKRA 13ATEX0032	IM1 Ex ia IMa	II 1G Ex ia IIC T6,T5 Ga II 1/2G Ex ia IIC T6,T5 Ga/Gb II 1D Ex ia IIIC T85/T95℃ Da	II 2G Ex ia IIC T6,T5 Gb	II 3G Ex nA IIC T6,T5 Gc	II 1D Ex ta IIIC T80/T90 ℃ T ₅₀₀ T90/T ₅₀₀ T100 ℃ Da II 2D Ex tb IIIC T80/T90 ℃ Db	II 3G Ex ic IIC T6,T5 Gc II 3D Ex ic IIIC T80/T90 ℃ Dc
IECEx DEK 14.0011X	Ex ia I Ma	Ex ia IIC T6,T5 Ga Ex ia IIC T6,T5 Ga/Gb Ex ia IIIC T85/T95 °C Da	Ex ia IIC T6,T5 Gb	Ex nA IIC T6,T5 Gc	Ex ta IIIC T80/T90 ℃ T ₅₀₀ T90/T ₅₀₀ T100 ℃ Da Ex tb IIIC T80/T90 ℃ Db	Ex ic IIC T6,T5 Gc Ex ic IIIC T80/T90 °C Dc
Application areas	Mining Protection class: Intrinsically	Gases conductive dust Protection class: Intrinsically safe ia with barrier	Gases Protection class: Intrinsically safe ia with barrier	Gases Protection class: Non-sparking nA	Conductive dust Protection class: Dustproof enclosure	Gases Conductive dust Protection class: Intrinsically safe ic with barrier
Electrical connection	safe ia with barrier 6	6	6	6	6	6
(See model code)		-			-	

Instruments for other protection types and zones are available upon request (see also page 1).



Impact protection / Safety sleeve: Protection types and applications:



connections:

M12x1 plug



HFT 31x6-F21

1	Signal+	

2	nc
<u> </u>	11.0.

•		
- 3	Signal-	

4 n.c.

Without threaded holes for temperature and pressure sensors:

Model	Measurement range	L	Н	D/SW	G	Tightening torque	DN
HFT 31XX-F21-0020	0.32 5.28 gpm	117 mm	158 mm	60 / 56 mm	SAE 8 (3/4 -16 UNF 2B)	60 Nm	7 mm

With threaded holes for temperature and pressure sensors:

Model	Measurement range	L	Н	D/SW	G	Tightening torque	DN	Thread
HFT 31XX- F21-0060	1.59 15.85 gpm	144 mm	160 mm	63 / 60 mm	SAE 14 (1 3/16 - 12 UN 2B)	140 Nm	11 mm	SAE 6
HFT 31XX- F21-0300	3.96 79.25 gpm	155 mm	173 mm	75.5 / 72 mm	SAE 20 (1 5/8 -12 UN 2B)	290 Nm	22 mm	SAE 6
HFT 31XX- F21-0600	10.57158.5 gpm	181mm	178 mm	81/76 mm	SAE 24 (1 7/8 -12 UN 2B)	325 Nm	30 mm	SAE 6

Model code:

		HFT 31 X	X – F21 –	<u> XXXX</u> – S	S- X-XXX- <u>XXX</u>	
Mechanical Process Con 8 = 3/4 -16 UNF 2B (SAE8 only for mr: 1.2 20 I 9 = 1 3/16 -12 UN 2B (SAE only for mr: 6 60 I/r H = 1 5/8 -12 UN 2B (SAE only for mr: 15 300 I B = 1 7/8 -12 UN 2B (SAE only for mr: 40 600 I/	nection female) /min E14 female) nin 20 female) /min 24 female) min					
Electrical connection — 6 = M12x1, 4 pole, male						
Signal F21 = 4 20 mA (with HA	RT Interface)					
Measuring ranges 0020 = 1.2 20 l/min (0 0060 = 6.0 60 l/min (1.5 0300 = 15.0 300 l/min (3 0600 = 40.0 600 l/min (1.5)	32 5.28 gpm) i9 15.85 gpm) .96 79.25 gpm) 0.57 158.5 gpm)]		
Housing material S = Stainless steel						
Housing design 1 = without threaded bore 3 = with two additional fem (measuring ranges (00	(measuring ranges ale threads 9/16-18 60, 0300, 0600)	0020) 3 UNF 2B (SAE 6),				
Approval — E = ATEX and IECEx se Isolation voltage — N = 50 V AC Protection types and app	e Applications/ Prot	tection Types (Overv	/iew)			
ATEX		IECEx				
1 = I M1 Exia I M II 1G Exia IICT II 1/2 G Exia IICT II 2 G Exia IICT II 2 G Exia IICT II 1D Exia IIICT	la '6,T5 Ga '6,T5 Ga/Gb 6,T5 Gb '85℃/T95℃ Da	Ex ia I Ma Ex ia IIC T6,T5 G Ex ia IIC T6,T5 G Ex ia IIC T6,T5 G Ex ia IIC T6,T5 G Ex ia IIIC T85°C/T9	a a/Gb b 95℃ Da			
9 = II 3G Ex nA IIC T6	T5 Gc	Ex nA IIC T6, T5 G	с			
$A = \begin{array}{c} & 0 \\ \text{II 1D Ex ta IIIC Ta} \\ T_{500}\text{T90/T} \\ \text{II 2D Ex tb IIIC Ta} \\ \end{array}$	20/T90 ℃ 500 T100 Da 30/T90 ℃ Db v in conjunction with alc	Ex ta IIIC T80/T90 T_{500} T90/T $_{500}$ T Ex tb IIIC T80/T90 potr connection "6"	℃ Da 00℃ Da ℃ Db			
C= II 3G Ex ic IIC T6,	II 3G Ex ic IIC T6, T5 Gc Ex ic IIC T6, T5 Gc					
II 3D Ex ic IIIC T80	/T90°C Dc	Ex ic IIIC T80/T90	°C Dc			
Modification number -						

000 = standard

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described please contact the relevant technical department. Subject to technical modifications.

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