HYDAC ELECTRONIC

Bedienungsanleitung
Druckmessumformer Serie HDA 4000
mit IECEx-Zulassung

(Original-Bedienungsanleitung)

Schutzklassen und Einsatzbereiche:

Ex ia I Ma
Ex ia IIC T6 Ga
Ex ia IIC T6 Ga/Gb
Ex ia IIC T6 Gb
Ex ic IIC T6/ T5/T4 Gc
Ex nA IIC T6/ T5 T4 Gc
Ex ia IIIC T85°C Da
Ex ic IIIC T80/90/100 °C Dc
Ex ta IIIC T80/90/100 °C Da T_{500} 90/100/110 °C Da
Ex tb IIIC T80/90/100 °C Db
Ex tc IIIC T80/90/100 °C Dc

Zertifikat: **IECEx KEM 08.0014X**
IECEx TSA 09.0041X

Prüfstelle: **DEKRA**

Inhaltsverzeichnis

1. Allgemeines

Falls Sie Fragen bezüglich der technischen Daten oder Eignung für Ihre Anwendungen haben, wenden Sie sich bitte an unseren **technischen Vertrieb**. Die Druckmessumformer der Serie HDA 4000 werden auf rechnergesteuerten Prüfplätzen abgeglichen und einem Endtest unterzogen. Sie sind wartungsfrei und sollten beim Einsatz innerhalb der Spezifikationen (siehe Technische Daten) einwandfrei arbeiten. Falls trotzdem Fehler auftreten, wenden Sie sich bitte an den **HYDAC-Service**. Fremdeingriffe in das Gerät führen zum Erlöschen jeglicher Gewährleistungsansprüche sowie der IECEx-Zulassung.

2. Funktion

Das vom Sensor gemessene Drucksignal wird in ein dem Druck proportionales, analoges 4..20 mA Signal umgewandelt. Der elektrische Anschluss erfolgt über einen Steckverbinder oder eine fest angeschlossene Leitung.

3. Montage und Inbetriebnahme

Die Druckmessumformer können auf Prozess-Seite direkt über den Gewindeanschluss montiert werden. Speziell bei Geräten mit frontbündiger (außenliegender) Membran ist bei der Montage darauf zu achten, dass die Membrane während der Montage nicht beschädigt wird.

Um in kritischen Anwendungsfällen (z.B. starke Vibrationen oder Schläge) einer mechanischen Zerstörung vorzubeugen, empfehlen wir das Gerät mittels einer Schelle mit Elastomereinsatz zu befestigen, sowie den Hydraulikanschluss über eine Minimessleitung zu entkoppeln.

Anzugsdrehmoment siehe Abmessungen.

Druckmessumformer mit einem Nenndruck ≤ 100 bar (≤ 1500 psi) besitzen einen Druckausgleich zum Umgebungsdruck. Hierzu befindet sich unter der Steckerbefestigung eine kleine Bohrung. Diese ist von innen mit einer speziellen Membrane abgedeckt, die verhindert, dass Feuchtigkeit von außen in das Gerät eindringen kann. Um eine Verstopfung der Bohrung zu verhindern, sollte bei feuchter und staubhaltiger Umgebung die Montage daher waagerecht oder senkrecht mit dem Druckanschluss nach unten erfolgen.

Bei Druckmessumformern mit einem Nenndruck von ≤ 100 bar (≤ 1500 psi) und einem ½“ Conduit elektrischen Anschluss ist der Druckausgleich bei Einzeladern mittels einer kurzen Entlüftungslitze realisiert, bei Mantelkabel mittels einem im Kabel integrierten Entlüftungsschlauch. Es ist sicherzustellen, dass die Entlüftung nur im Nicht-Ex-Bereich erfolgt.

Die Installation muss von einem Fachmann nach den jeweiligen Landesvorschriften zu potentiell explosionsgefährdeten Umgebungen durchgeführt werden (z.B. IEC / EN 60079-14).

Die Druckmessumformer der Serie HDA 4000 tragen das CE - Zeichen. Die Konformitätserklärung befindet sich im Anhang.

Die Forderungen der Normen (siehe techn. Daten) werden nur bei ordnungsgemäßer und fachmännischer Erdung des Druckmessumformergehäuses mittels des Prozessanschlusses oder dem ½ NPT Conduit erreicht. Sofern eine grün/gelbe Ader vorhanden ist, darf diese zusätzlich, aber nicht zur alleinigen Erdung verwendet werden. Bei Schlauchmontage des Druckmessumformers muss das Gehäuse separat geerdet werden.

Die zugehörigen eigensicheren Geräte (z.B. Zenerbarrieren) sind ebenfalls zu erden. Ein Potentialausgleich entlang des eigensicheren Stromkreises ist in der Ausführungsvariante N (Isolationsspannung ≤ 50 VAC) erforderlich.

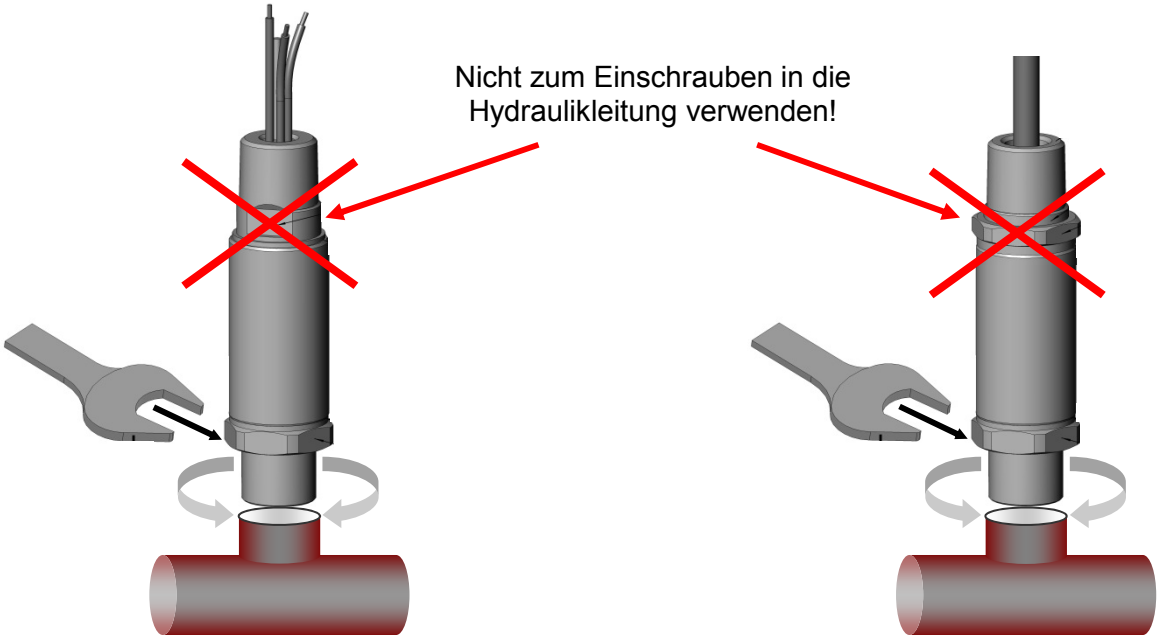
Bei der Serie HDA 4000 in der Ausführungsform H (Isolationsspannung ≤ 500 VAC) darf die Kabellänge zum Druckmessumformer maximal 30m betragen (Überspannungsschutz nach DIN EN 61000-6-2). Wenn die Kabellänge 30 m überschreitet, muss der Überspannungsschutz kundenseitig sichergestellt werden.

4. Wichtige Hinweise für die Conduit-Installation

4.1 Installationshinweise für Geräte mit ½ “ NPT Conduit

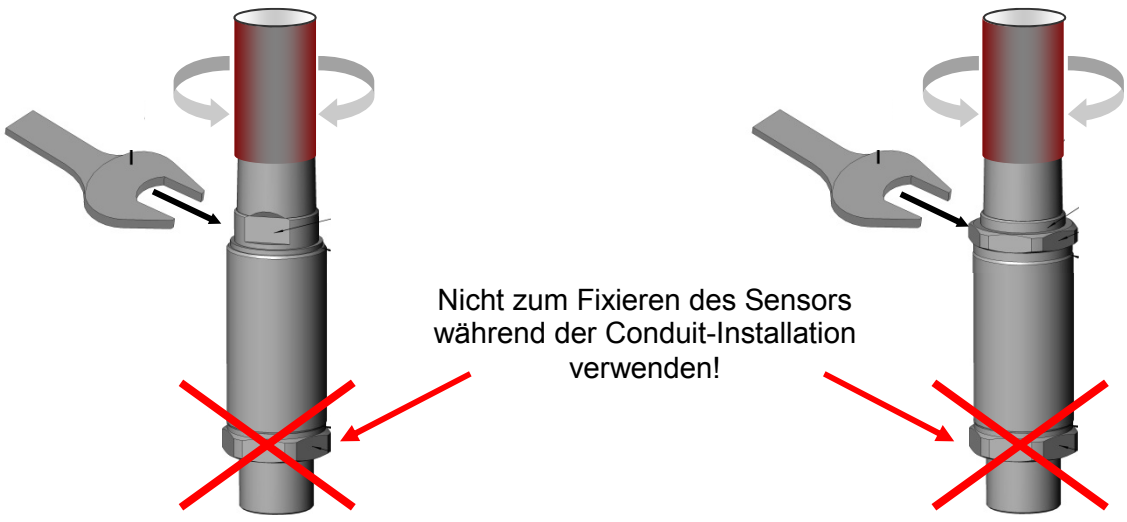
Mechanische Installation

Für die Montage des Prozessanschlusses darf nur die Schlüsselfläche 27mm an der Prozessanschlussseite des Druckmessumformers verwendet werden.



Elektrische Installation

Die Schlüsselfläche an der Seite des elektrischen Anschlusses am ½ NPT Conduit dient nur zum Fixieren des Druckmessumformers bei der Conduit-Installation.



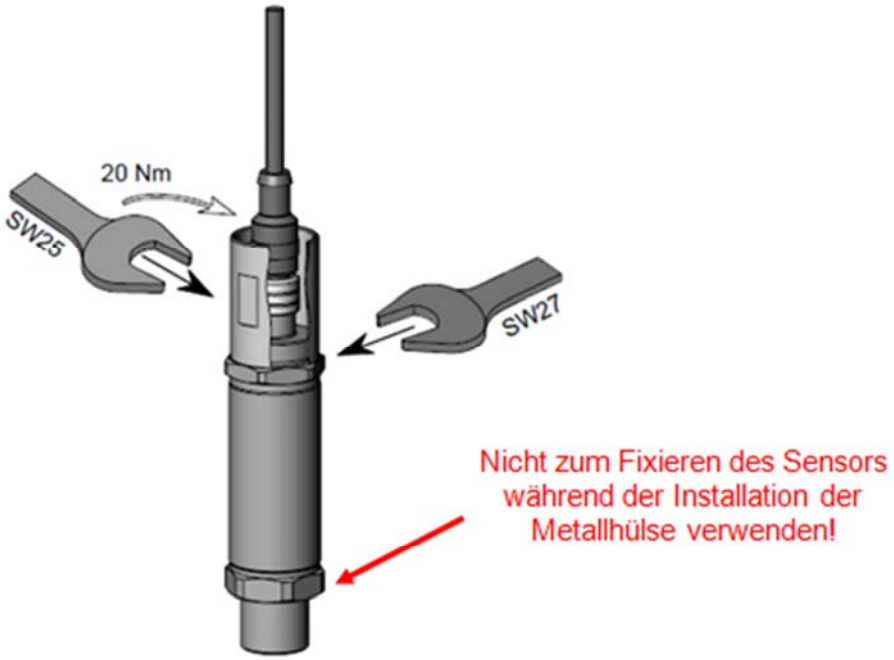
4.2 Installationshinweise für Geräte mit Schlagschutz

Installationshinweise für Geräte mit M12×1 Stecker mit Schlagschutz-/Sicherungs- Metallhülse für den Einsatz in:
Ex nA IIC T6 Gc
Ex ta IIIC T80°C T_{500}T90°C Da
Ex tb IIIC T80°C Db
Zur Einhaltung der Sicherheitsrichtlinien ist, für diese Schutzklassen und Einsatzbereiche, die Verwendung der Schlagschutz-/ Sicherungs- Metallhülse zwingend erforderlich.

Die Schlüsselfläche 27mm an der Seite des elektrischen Anschlusses dient nur zum Fixieren des Druckmessumformers bei Installation der Schlagschutz-/Sicherungs-Metallhülse.

Die Schlagschutz-/Sicherungs- Metallhülse ist mit einem Anzugsdrehmoment von 20 Nm anzuziehen.

Das Anschlusskabel mit M12x1 Stecker muss im spannungslosen Zustand ordnungsgemäß angeschlossen und die mitgelieferte Schlagschutz-/Sicherungs-Metallhülse montiert werden. Auch die Trennung des M12x1 Steckers darf nur im Spannungslosen Zustand erfolgen.



5. Sicherheitshinweise

Wenn das Etikett nicht mehr lesbar ist, muss der Druckmessumformer außer Betrieb gesetzt werden.
Sicherheitsbarrieren zum Anschluss der Druckmessumformer sind generell in Zündschutzart "ia" auszuführen.

Die Dichtungen sind in regelmäßigen Abständen, in Abhängigkeit der klimatischen Bedingungen und dem Medieneinfluss, auf ihre Funktionstüchtigkeit zu kontrollieren und wenn erforderlich auszutauschen. Ersatzdichtungen und –flachdichtungen können von der HYDAC ELECTRONIC GMBH bezogen werden. (Standarddichtungen siehe technische Daten). Diese Überprüfung muss mindestens alle drei Jahre durchgeführt werden.

Für HDA 41xx / 43xx mit keramischem Sensorelement:

Bei gleichzeitigem Einsatz in Zone 0 und 1 wirkt die Keramik-Messmembrane des Druckmessumformers als "Trennwand" zwischen Zone 0 und Zone 1. Die Dicke dieser "Trennwand" ist generell ≤ 1mm und bei Nenndruck unter 1 bar ≤ 0,2 mm. Zur Sicherstellung dieser Trennfunktion ist unbedingt auf die Verträglichkeit der Messmedien mit den verwendeten Werkstoffen des Druckmessumformers zu achten, ebenso sind die Überlast- und Berstdrücke unbedingt einzuhalten (Angaben hierzu siehe "Technische Daten").

Für HDA 44xx / 47xx mit Edelstahl Sensorelement:

Bei gleichzeitigem Einsatz in Zone 0 und 1 wirkt die Metall-Messmembrane des Druckmessumformers als "Trennwand" zwischen Zone 0 und Zone 1. Die Dicke dieser "Trennwand" ist generell ≤ 1mm und bei Nenndruck unter 100 bar ≤ 0,2 mm. Zur Sicherstellung dieser Trennfunktion ist unbedingt auf die Verträglichkeit der Messmedien mit den verwendeten Werkstoffen des Druckmessumformers zu achten, ebenso sind die Überlast- und Berstdrücke unbedingt einzuhalten (Angaben hierzu siehe "Technische Daten").

Es ist unbedingt auf die Verträglichkeit der Messmedien mit den verwendeten Werkstoffen des Druckmessumformers zu achten; ebenso sind die Überlast- und Berstdrücke unbedingt einzuhalten (Angaben hierzu siehe "Technische Daten" und "Sicherheitstechnische Daten" der EG Baumusterprüfbescheinigung).

Die interne Messmembrane des Druckmessumformers ist unbedingt vor mechanischer Beschädigung zu schützen. Dieses gilt insbesondere bei Geräten mit einer frontbündigen Membrane und bei gleichzeitigem Einsatz in Zone 0 und 1 sowie Zone 1 und 2.

Das Trennmittel zwischen der frontbündigen Membrane und der internen Membrane ist Paraffinöl (Weißöl, S933).
Ebenso ist auf eine ausreichende Dichtung zwischen den Zonen zu achten.

Die Daten hinsichtlich der Nutzung in explosionsgefährdeten Umgebungen sind in jedem Fall zu berücksichtigen.

Der Betrieb ist nur zulässig, wenn anwendungs- und prozessbedingte intensive elektrostatische Aufladungsprozesse ausgeschlossen sind.

Bei Einsatz in Atmosphären von brennbaren Stäuben ist der Druckmessumformer geschützt vor Beschädigungen und Schlag anzubringen.

Aus Sicherheitsgründen sollten Stromversorgung / Ausgangsstromkreis des Druckmessumformers geerdet werden.

Zur Einhaltung der Sicherheitsrichtlinien ist für die Schutzklassen und Einsatzbereiche:
Ex nA IIC T6 Gc / Ex ta IIIC T80°C T_{500}T90°C Da und Ex tb III C T80°C Db
die Verwendung der Schlagschutz-/ Sicherungs- Metallhülse (für M12x1 Stecker) zwingend erforderlich. Die Schlagschutz-/Sicherungs- Metallhülse ist mit einem Anzugsdrehmoment von 20 Nm anzuziehen.

Der Betrieb in Bereichen die Kategorie 1G Betriebsmittel erfordern, ist nur zulässig, wenn anwendungs- und prozessbedingte intensive elektrostatische Aufladungsprozesse ausgeschlossen sind.

6. Technische Daten

Eingangskenngrößen		**HDA 4100 (Absolutdruck)**						**HDA 4300 (Relativdruck)**			
		absolut und relativ		relativ							
Messbereiche	bar	1	2,5	-1 .. 1	-1 .. 9	4	6	10	16	25	40
Überlastbereiche	bar	3	8	3	32	12	20	32	50	80	120
Berstdrücke	bar	5	12	5	48	18	30	48	75	120	180
		absolut und relativ			relativ						
Messbereiche	psi	15	30	50	100	150	250	500			
Überlastbereiche	psi	45	100	150	290	450	725	1500			
Berstdrücke	psi	70	150	250	400	650	1000	2500			
Mechanischer Anschluss		siehe Typenschlüssel / Abmessungen									
Anzugsdrehmoment		siehe Abmessungen									
Medienberührende Teile					**Standard**			**Frontbündig**			
		Sensor:			Keramik			Keramik			
		Anschlussstück:			1.4301			1.4301; 1.4435			
		Dichtung:			FPM/ EPDM			FPM			
		O-Ring						FPM			
Druckmittlerflüssigkeit								Silikon freies Öl			

Ausgangsgrößen			
Ausgangssignal		4 .. 20 mA (2-Leiter), $R_{Lmax.} = (U_B - 12\ V) / 20\ mA\ [k\Omega]$	
Kennlinienabweichung bei Grenzpunkteinstellung nach DIN 16086	Typ. Max.	≤ ± 0,5 % FS ≤ ± 1,0 % FS	≤ ± 0,5 % FS ≤ ± 1,0 % FS
Kennlinienabweichung bei Kleinstwerteinstellung (B.F.S.L)	Typ. Max.	≤ ± 0,25 % FS ≤ ± 0,5 % FS	≤ ± 0,25 % FS ≤ ± 0,5 % FS
Temperaturkompensation Nullpunkt	Typ. Max.	≤ ± 0,02 % / °C ≤ ± 0,03 % / °C	≤ ± 0,02 % / °C ≤ ± 0,03 % / °C
Temperaturkompensation Spanne	Typ. Max	≤ ± 0,02 % / °C ≤ ± 0,03 % / °C	≤ ± 0,02 % / °C ≤ ± 0,03 % / °C
Nicht-Linearität bei Grenzpunkteinstellung nach DIN 16086	Max.	≤ ± 0,5 % FS	≤ ± 0,5 % FS
Hysterese	Max.	≤ ± 0,4 % FS	≤ ± 0,4 % FS
Wiederholbarkeit		≤ ± 0,1 % FS	≤ ± 0,1 % FS
Anstiegszeit		≤ 1,5 ms	≤ 1,5 ms
Langzeitdrift	Typ.	≤ ± 0,3 % FS / Jahr	≤ ± 0,3 % FS / Jahr

Umgebungsbedingungen		
Kompensierter Temperaturbereich		-20 .. + 85 °C
Betriebstemperaturbereich		-20 .. + 60 °C
Lagertemperaturbereich		-40 .. +100 °C
Mediumstemperaturbereich [1)]		-40 .. + 60 °C/ -20 .. + 60 °C
CE - Zeichen		EN 61000-6-1 /2 /3 /4 IEC 60079-0 /11 /26 /36
Vibrationsbeständigkeit nach IEC 68-2-6 bei 10 ..500Hz		≤ 20 g
Schutzart nach IEC 60529		IP 65 (Stecker EN 175301-803 (DIN 43650) und Binder 714 M18) IP 67 (M12x1 Stecker, bei Verwendung einer IP 67 Kupplungsdose)

Relevante Daten für die Ex-Anwendung		**Ex ia, ic**	**Ex nA, ta, tb, tc**
Versorgungsspannung		U_i = 12 .. 28V	12 .. 28 V DC
Maximaler Speisestrom		Ii = 100 mA	
Maximale Speiseleistung		P_i = 1W	max. Leistungsaufnahme ≤ 1W
Anschlusskapazität des Druckmessumformers		C_i ≤ 22 nF	
Induktivität des Druckmessumformers		Li = 0 mH	
Isolationsspannung		50 V AC, mit integriertem Überspannungsschutz EN 61000-6-2 oder 500 V AC, je nach Ausführung (siehe Typenschlüssel)	

Sonstige Größen		
Verpolungsschutz der Versorgungsspannung, Lastkurzschlussfestigkeit		vorhanden
Restwelligkeit Versorgungsspannung		≤ 5 %
Lebensdauer		> 10 Mio. Lastwechsel
Gewicht		ca. 180 g

Anmerkung: **FS** (**F**ull **S**cale) = bezogen auf den vollen Messbereich
B.F.S.L = **B**est **F**it **S**traight **L**ine

[1)] -20 °C mit FPM- oder EPDM-Dichtung, -40°C auf Anfrage

Eingangskenngrößen		**HDA 4400**						**HDA 4700**					
Messbereiche	bar	-1..5	-1..9	6	16	40	60	100	160	250	400	600	1000
Überlastbereiche	bar	15	20	15	32	80	120	200	320	500	800	900[1)]	1600
Berstdrücke	bar	100	100	100	200	200	300	500	800	1000	2000	2000	3000
Messbereiche	psi	100	150	200	300	500	600	700	750	1000			
	psi	1500	2000	3000	5000	6000	9000	10000	15000				
Überlastbereiche	psi	290	290	460	1160	1160	1160	1740	1740	2900			
	psi	2900	4600	7250	11600	11600	14500	14500	23200				
Berstdrücke	psi	1450	1450	2900	2900	2900	2900	4350	4350	7250			
	psi	7250	11600	14500	29000	29000	29000	29000	43500				

Mechanischer Anschluss		siehe Typenschlüssel / Abmessungen		
Anzugsdrehmoment		siehe Abmessungen		
			Standard	**Frontbündig**
		Edelstahl	1.4435; 1.4301	1.4435; 1.4301
		Dichtung	FPM	FPM
		O-Ring		FPM
Druckmittlerflüssigkeit				Silikon freies Öl
Ausgangsgrößen				
Ausgangssignal		4 .. 20 mA (2-Leiter), $R_{Lmax.} = (U_B - 12\ V) / 20\ mA\ [k\Omega]$		
Kennlinienabweichung bei Grenzpunkteinstellung nach DIN 16086	Typ. Max.	≤ ± 0,5 % FS ≤ ± 1,0 % FS		≤ ± 0,25 % FS ≤ ± 0,5 % FS
Kennlinienabweichung bei Kleinstwerteinstellung	Typ. Max.	≤ ± 0,25 % FS ≤ ± 0,5 % FS		≤ ± 0,15 % FS ≤ ± 0,25 % FS
Temperaturkompensation Nullpunkt	Typ. Max.	≤ ± 0,015 % / °C ≤ ± 0,025 % / °C		≤ ± 0,008 % / °C ≤ ± 0,015 % / °C
Temperaturkompensation Spanne	Typ. Max.	≤ ± 0,015 % / °C ≤ ± 0,025 % / °C		≤ ± 0,008 % / °C ≤ ± 0,015 % / °C
Nicht-Linearität bei Grenzpunkteinstellung nach DIN 16086	Max.	≤ ± 0,3% FS		≤ ± 0,3 % FS
Hysterese	Max.	≤ ± 0,4 % FS		≤ ± 0,1 % FS
Wiederholbarkeit		≤ ± 0,1 % FS		≤ ± 0,05 % FS
Anstiegszeit		≤ 1,5 ms		≤ 1,5 ms
Langzeitdrift	Typ.	≤ ± 0,3 % FS / Jahr		≤ ± 0,1 % FS / Jahr
Umgebungsbedingungen				
Kompensierter Temperaturbereich		-20 .. + 85°C		
Betriebstemperaturbereich[2)]		-20 .. + 60 °C		-40 .. + 60 °C / -20 .. + 60 °C
Lagertemperaturbereich		-40 .. +100 °C		
Mediumstemperaturbereich[2)]		-40 .. + 60 °C / -20 .. + 60 °C		
CE - Zeichen		EN 61000-6-1/2/3/4 IEC 60079-0/11/26/36		
Vibrationsbeständigkeit nach IEC 68-2-6 bei 10 ..500Hz		≤ 20 g		
Schutzart nach IEC 60529		IP 65 (Stecker EN175301-803 (DIN 43650) und Binder 714 M18) IP 67 (M12x1 Stecker, bei Verwendung einer IP 67 Kupplungsdose)		
Relevante Daten für die Ex-Anwendung		**Ex ia, ic**		**Ex nA, ta, tb, tc**
Versorgungsspannung		U_i = 12 .. 28V		12 .. 28 V
Maximaler Speisestrom		Ii = 100 mA		
Maximale Speiseleistung		P_i = 1W		max. Leistungsaufnahme ≤ 1W
Anschlusskapazität des Druckmessumformers		$C_i \leq 22$ nF		
Induktivität des Druckmessumformers		Li = 0 mH		
Isolationsspannung		50 V AC, mit integriertem Überspannungsschutz EN 61000-6-2 oder 500 V AC, je nach Ausführung (siehe Typenschlüssel)		
Sonstige Größen				
Verpolungsschutz der Versorgungsspannung, Lastkurzschlussfestigkeit Überspannungschutz		vorhanden		
Restwelligkeit Versorgungsspannung		≤ 5 %		
Lebensdauer		> 10 Mio. Lastwechsel		
Gewicht		ca. 150 g (Standard) ca. 180 g (Frontbündig)		

Anmerkung: **FS** (**F**ull **S**cale) = bezogen auf den vollen Messbereich
B.F.S.L = **B**est **F**it **S**traight **L**ine

[1)] in der Standardausführung Überlastbereich 1000 bar, in der Ausführung Frontbündig Überlastbereich 900 bar
[2)] -20°C mit FPM-Dichtung, -40°C auf Anfrage

7. Typenschlüssel

7.1 Standard

Typenschlüssel HDA 4100 / HDA 4300

HDA 4 X X X - A - XXXXX - I X X - XXX - X1 (psi) XX inch

Genauigkeit

1 = 1% FS max., Keramik absolut
3 = 1% FS max., Keramik relativ

Mechanischer Anschluss

4 = G 1/4 A DIN 3852, Außengewinde
5 = 7/16-20 UNF 2B (SAE 4), Innengewinde
6 = 7/16-20 UNF 2A (SAE 4), Außengewinde
7 = 9/16-18 UNF 2A (SAE 6), Außengewinde
8 = 1/4-18 NPT, Außengewinde
C = SF250CX, Autoclave (7/16-20 UNF 2B), Innengewinde
F = 1/4-18 NPT, Innengewinde

Elektrischer Anschluss

1 = freies Kabelende
4 = Gerätestecker, Binder Serie 714 M18, 4 pol.
5 = Gerätestecker, DIN 43650, 3 pol. + PE
6 = Gerätestecker, M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (Außengewinde)
A = Gerätestecker EN 175301-803(DIN 43650) , 3 pol. + PE, 1/2" Conduit Innengewinde

Signal

A = 4 .. 20 mA

Messbereiche

Angabe in bar oder psi (bei psi zusätzliches Kennzeichen nach der Modifikationsnummer)

Zulassung

I = IECEx (genauere Angaben siehe Zulassungsunterlagen)

Isolationsspannung

H = 500 V AC gegen Gehäuse
N = 50 V AC gegen Gehäuse

Schutzklassen und Einsatzgebiete (siehe Tabelle, Kap.7.3)

1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modifikationsnummer

000 = Standard
(andere Nummer wird z.B. verwendet für: Versionen Düse, PIN-Belegung, Stecker am freien Kabelende)

Dichtungsmaterial (medienberührend)

F = FPM-Dichtung (z.B. für Hydrauliköle)
E = EPDM-Dichtung (z.B. für Kältemittel)

Anschlussmaterial (medienberührend)

1 = Edelstahl

(psi)

Zusätzliche Kennzeichnung für psi-Messbereiche (entfällt bei bar-Messbereichen)

Kabellänge (z.B. für Conduit-Rohranschluss oder freies Kabelende)

Angabe in m oder inch im Klartext

Typenschlüssel HDA 4400 / HDA 4700

HDA 4 X X X - A - XXXXX - I X X - XXX (psi) XX inch

Genauigkeit

4 = 1% FS max.
7 = 0.5% FS max.

Mechanischer Anschluss

2 = G 1/2 DIN 3852
4 = G 1/4 A DIN 3852, Außengewinde
5 = 7/16-20 UNF 2B (SAE 4), Innengewinde
6 = 7/16-20 UNF 2A (SAE 4), Außengewinde
7 = 9/16-18 UNF 2A (SAE 6), Außengewinde
8 = 1/4-18 NPT, Außengewinde
C = SF250CX, Autoclave (7/16-20 UNF 2B), Innengewinde
F = 1/4-18 NPT, Innengewinde

Elektrischer Anschluss

1 = freies Kabelende
4 = Gerätestecker, Binder Serie 714 M18, 4 pol.
5 = Gerätestecker, DIN 43650, 3 pol. + PE
6 = Gerätestecker, M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (Außengewinde)
A = = Gerätestecker EN 175301-803 (DIN 43650) , 3 pol. + PE, 1/2" Conduit Innengewinde

Signal

A = 4 .. 20 mA

Messbereiche

Angabe in bar oder psi (bei psi zusätzliches Kennzeichen nach der Modifikationsnummer)

Zulassung

I = IECEx (genauere Angaben siehe Zulassungsunterlagen)

Isolationsspannung

H = 500 V AC gegen Gehäuse
N = 50 V AC gegen Gehäuse

Schutzklassen und Einsatzgebiete (siehe Tabelle, Kap.7.3)

1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modifikationsnummer

000 = Standard
(andere Nummer wird z.B. verwendet für: Versionen Düse, PIN-Belegung, Stecker am freien Kabelende)

(psi)

Zusätzliche Kennzeichnung für psi-Messbereiche (entfällt bei bar-Messbereichen)

Kabellänge (z.B. für Conduit-Rohranschluss oder freies Kabelende)

Angabe in m oder inch im Klartext

7.2 Typenschlüssel Frontbündig

Typenschlüssel HDA 4100 / HDA 4300

HDA 4 X X X - A - XXXXX - XXX- I X X - XXX - X1 (psi) XX inch

Genauigkeit

1 = 1% FS max., Keramik absolut
3 = 1% FS max., Keramik relativ

Prozessanschluss

Z = Frontbündig

Elektrischer Anschluss

1 = freies Kabelende
4 = Gerätestecker, Binder Serie 714 M18, 4 pol.
5 = Gerätestecker, DIN 43650, 3 pol. + PE
6 = Gerätestecker, M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (Außengewinde)
A = Gerätestecker DIN 43650 , 3 pol. + PE, 1/2" Conduit Innengewinde

Signal

A = 4 .. 20 mA

Messbereiche

Angabe in bar oder psi (bei psi zusätzliches Kennzeichen nach der Modifikationsnummer)

Anschlussart mechanisch

G01 = G1/2 A, DIN 3852
G02 = G1/2 mit zusätzlicher frontseitiger O-Ring Dichtung
G04 = G1/4 mit zusätzlicher frontseitiger O-Ring-Dichtung

Zulassung

I = IECEx (genauere Angaben siehe Zulassungsunterlagen)

Isolationsspannung

H = 500 V AC gegen Gehäuse
N = 50 V AC gegen Gehäuse

Schutzklassen und Einsatzgebiete (siehe Tabelle, Kap.7.3)

1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modifikationsnummer

000 = Standard
(andere Nummer z.B. verwendet für: Versionen Düse, PIN-Belegung, Stecker am freien Kabelende)

Dichtungsmaterial (medienberührend)

F = FPM-Dichtung (z.B. für Hydrauliköle)
E = EPDM-Dichtung (z.B. für Kältemittel)

Anschlussmaterial (medienberührend)

1 = Edelstahl

(psi)

Zusätzliche Kennzeichnung für psi-Messbereiche (entfällt bei bar-Messbereichen)

Kabellänge (z.B. für Conduit-Rohranschluss oder freies Kabelende)

Angabe in m oder inch im Klartext

Typenschlüssel HDA 4400 / HDA 4700

HDA 4 X X X - A - XXXXX - XXX - I X X - XXX (psi) XX inch

Genauigkeit

4 = 1% FS max.
7 = 0.5% FS max.

Prozessanschluss

Z = Frontbündig

Elektrischer Anschluss

1 = freies Kabelende
4 = Gerätestecker, Binder Serie 714 M18, 4 pol.
5 = Gerätestecker, DIN 43650, 3 pol. + PE
6 = Gerätestecker, M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (Außengewinde)
A = Gerätestecker EN 175301-803 (DIN 43650) , 3 pol. + PE, 1/2" Conduit Innengewinde

Signal

A = 4 .. 20 mA

Messbereiche

Angabe in bar oder psi (bei psi zusätzliches Kennzeichen nach der Modifikationsnummer)

Anschlussart mechanisch

G01 = G1/2 A, DIN 3852
G02 = G1/2 mit zusätzlicher frontseitiger O-Ring Dichtung
G04 = G1/4 mit zusätzlicher frontseitiger O-Ring-Dichtung

Zulassung

I = IECEx (genauere Angaben siehe Zulassungsunterlagen)

Isolationsspannung

H = 500 V AC gegen Gehäuse
N = 50 V AC gegen Gehäuse

Schutzklassen und Einsatzgebiete (siehe Tabelle, Kap.7.3)

1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modifikationsnummer

000 = Standard
(andere Nummer wird z.B. verwendet für: Versionen Düse, PIN-Belegung, Stecker am freien Kabelende)

(psi)

Zusätzliche Kennzeichnung für psi-Messbereiche (entfällt bei bar-Messbereichen)

Kabellänge (z.B. für Conduit-Rohranschluss oder freies Kabelende)

Angabe in m oder inch im Klartext

7.3 Auswertetabelle: Zuordnung der Schutzklassen und Einsatzbereiche

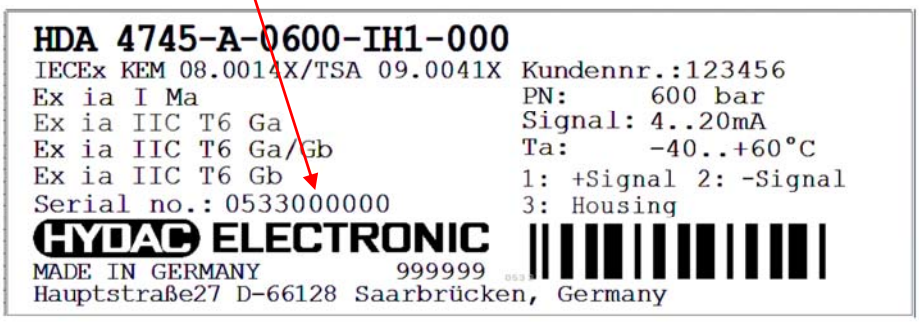
Schutzklasse und Einsatzgebiete			Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80°C T_{500}T90°C Da Ex tb IIIC T80°C Db	Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc	Ex ia IIIC T85° C Da
Einsatzgebiete			Geräteschutz-niveau Ma Bergbau Schutzart: eigensicher ia mit Barriere	Geräteschutzniveau Ga, Ga/Gb Gase Schutzart: eigensicher ia mit Barriere	Geräteschutzniveau Gb Gase Schutzart: eigensicher ia mit Barriere	Geräteschutzniveau Gc Gase Schutzart: nicht funkend nA	Geräteschutzniveau Da, Db leitender Staub Schutzart: staubgeschütztes Gehäuse	Geräteschutzniveau Gc, Dc Gase / leitender Staub Schutzart: eigensicher ic mit Barriere	Geräteschutzniveau Da leitender Staub Schutzart: eigensicher ia mit Barriere
Elektrischer Anschluss			4,5,6	4,5,6	4,5,6	6	6	4,5,6	4,5,6
Typen-schlüssel-Kennzahl	IECEx	IECEx Australien							
1	✓	✓	✓	✓	✓				
9	✓					✓			
A	✓						✓		
C	✓							✓	
D	✓		✓	✓	✓				✓

7.4 Seriennummer

In der Seriennummer ist neben der fortlaufenden Seriennummer die Kalenderwoche und das Jahr der Herstellung des Geräts enthalten.

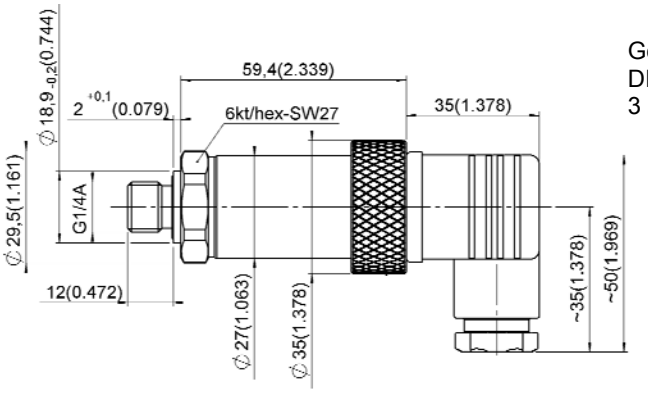
Aufbau Seriennummer: xxyykzzzzzz

XX	Fertigungsjahr	z.B. : 3 → 2013
yy	Kalenderwoche	z.B. : 10→ KW 10
k	Seriennummer-Index	z.B. : A
zzzzzz	fortlaufende Seriennummer	z.B. : 000001



8. Geräteabmessungen

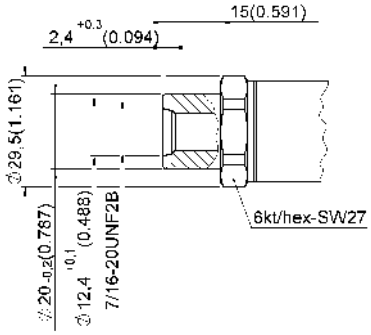
DIN 3852-E-G1/4A ,
Außengewinde
Anzugsdrehmoment: 20 Nm



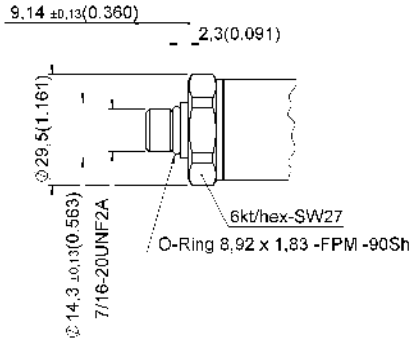
Gerätestecker
DIN 43650
3 pol. + PE

8.1. Mechanische Anschlussvarianten :

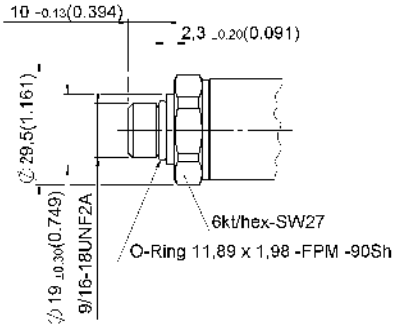
7/16-20 UNF 2B (SAE 4),
Innengewinde
Anzugsdrehmoment: 15 Nm



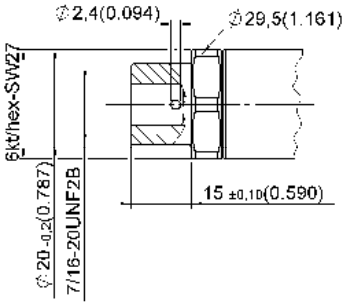
7/16-20 UNF 2A (SAE 4),
Außengewinde
Anzugsdrehmoment: 15 Nm



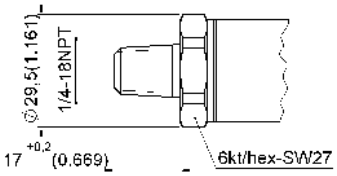
9/16-18 UNF 2A (SAE 6),
Außengewinde
Anzugsdrehmoment: 20 Nm



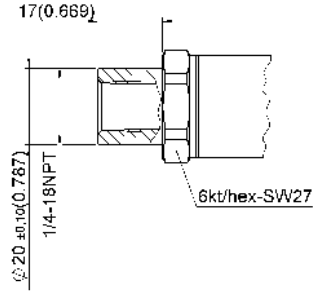
SF 250CX, Autoclave
(7/16-20 UNF 2B), Innengewinde
Anzugsdrehmoment: 15 Nm



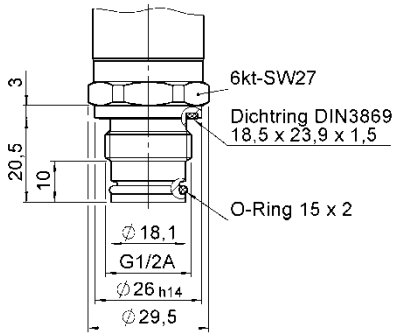
1/4-18 NPT,
Außengewinde
Anzugsdrehmoment: maximal 40 Nm



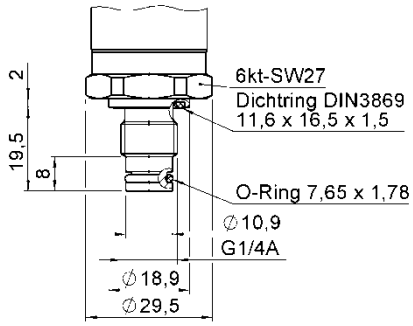
1/4-18 NPT,
Innengewinde
Anzugsdrehmoment: maximal 40 Nm



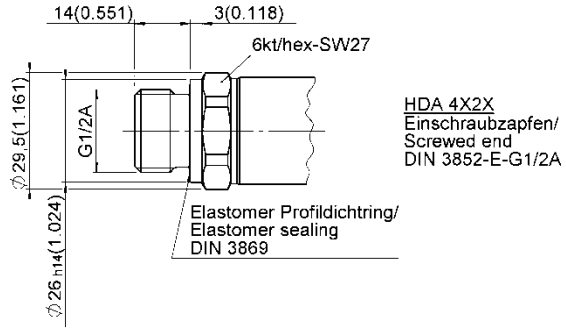
G 1/2 mit zusätzlicher frontseitiger O-Ring-Dichtung,
Anzugsdrehmoment: maximal 45 Nm



G 1/4 mit zusätzlicher frontseitiger O-Ring-Dichtung
Anzugsdrehmoment: maximal 20 Nm

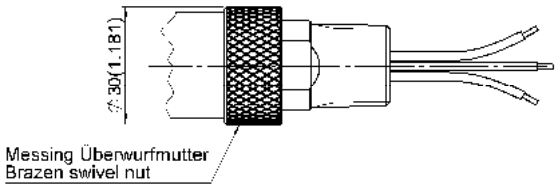


G 1/2 A DIN 3852
Anzugsdrehmoment: maximal 45 Nm

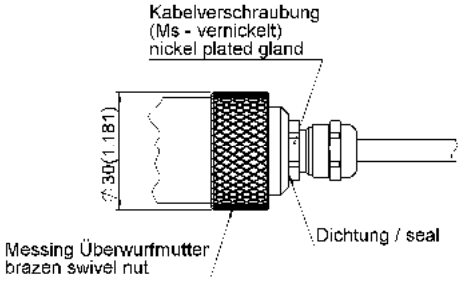


8.2. Elektrische Anschlussvarianten:

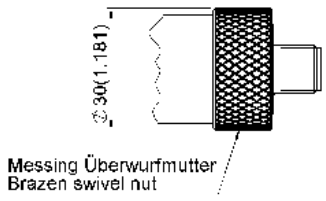
1/2-14 NPT Conduit (Außengewinde)



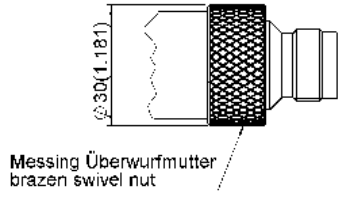
Freies Kabelende



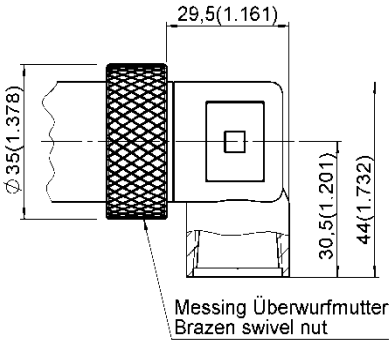
Gerätestecker, M12x1, 4 pol.



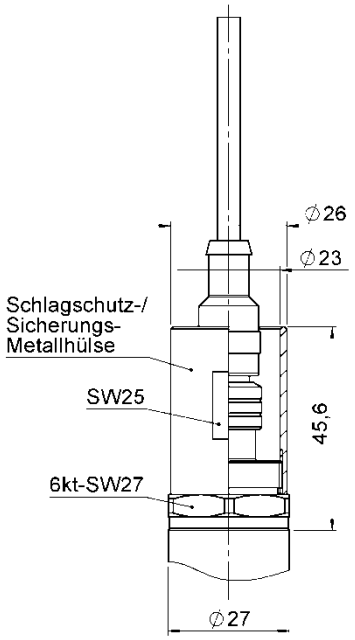
Gerätestecker, Binder Serie 714 M18, 4 pol.



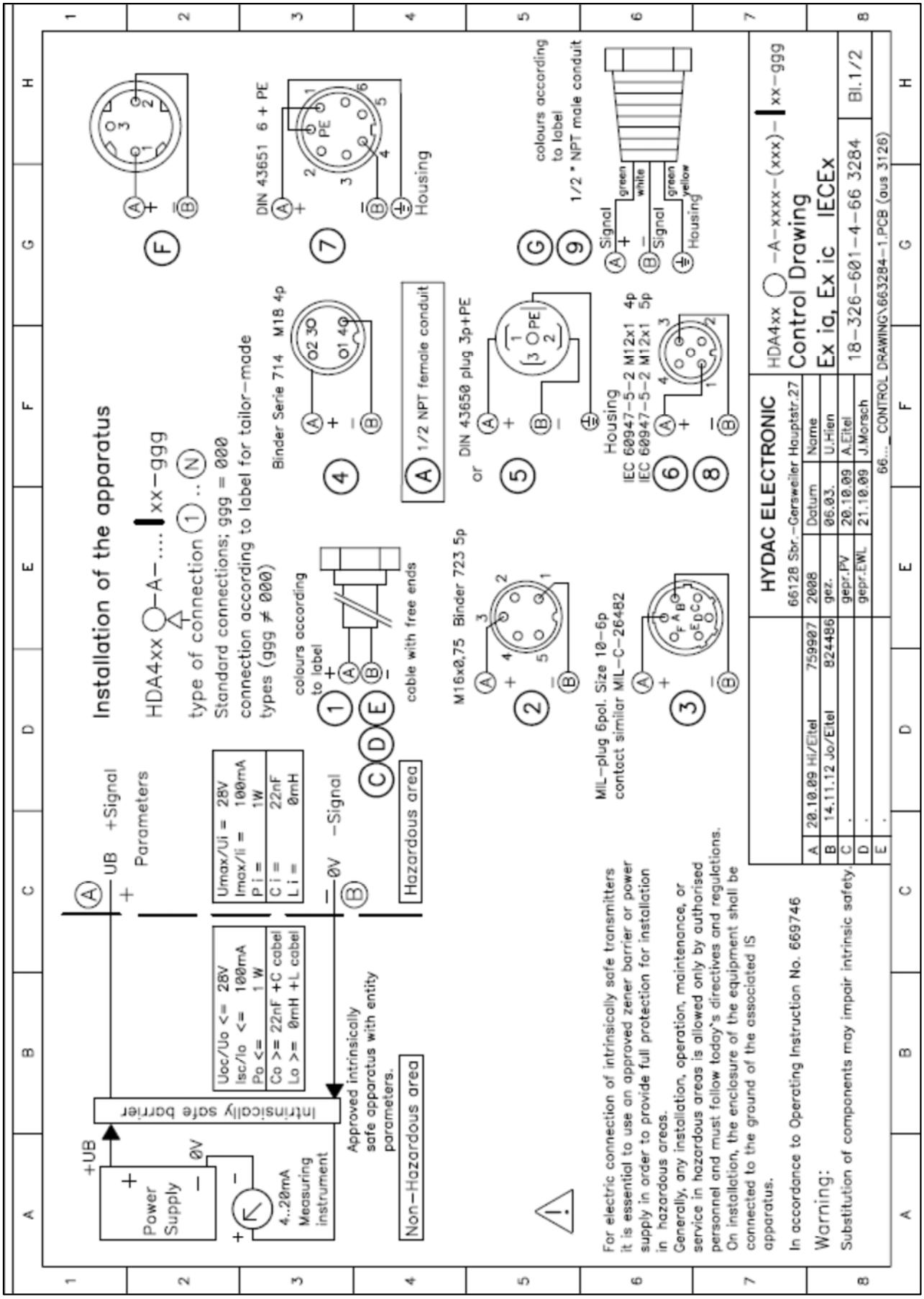
Gerätestecker DIN 43650 , 3 pol. + PE,
1/2" Conduit Innengewinde

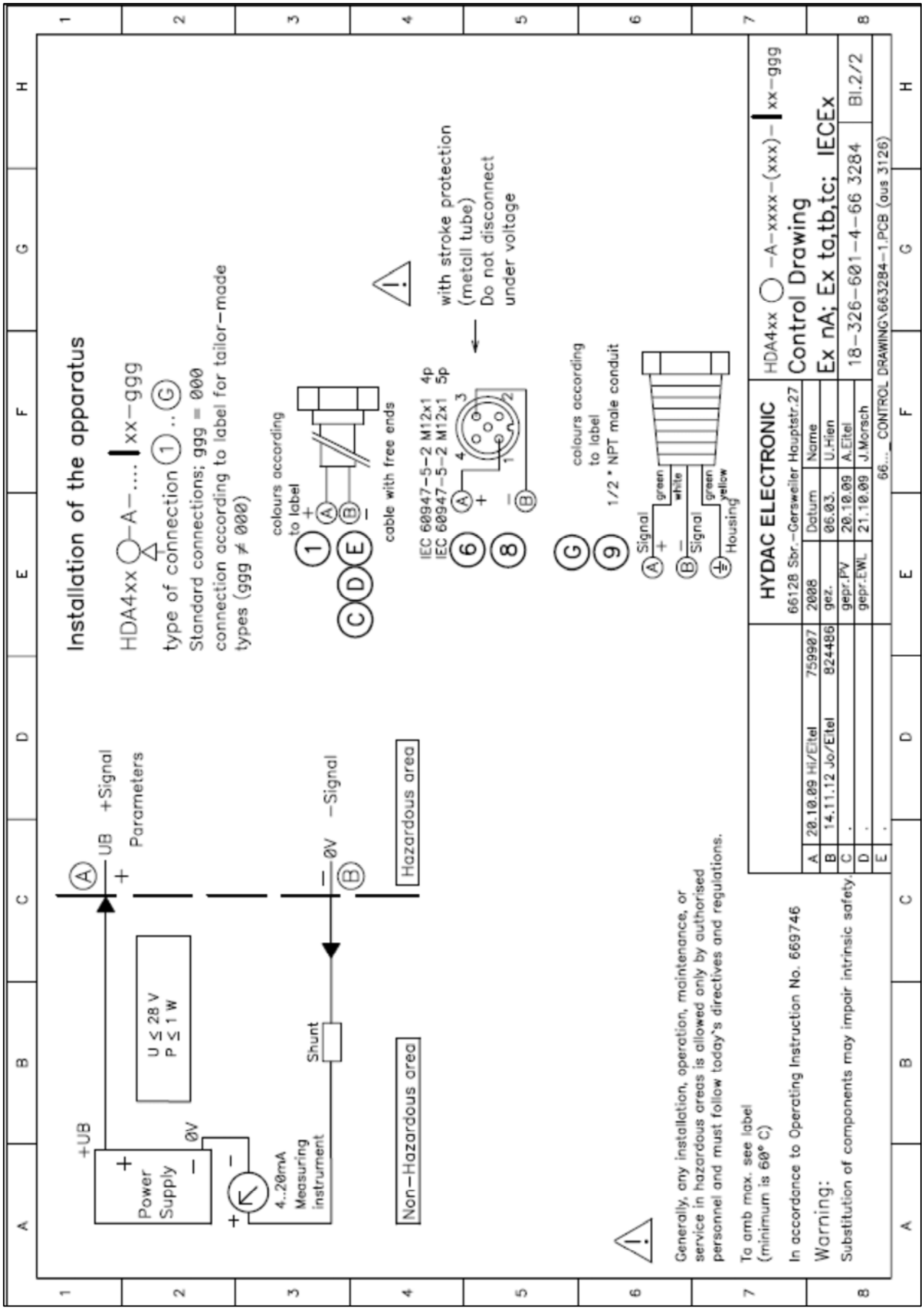


Schlagschutz-/ Sicherungs-Metallhülse:



9. Kontrollzeichnung




Installation of the apparatus
HDA4xx A-.... xx-ggg
type of connection 1 .. G
Standard connections; ggg = 000
connection according to label for tailor-made types (ggg ≠ 000)
with stroke protection (metall tube)
Do not disconnect under voltage
colours according to label
cable with free ends
IEC 60947-5-2 M12x1 4p
IEC 60947-5-2 M12x1 5p
colours according to label
1/2" NPT male conduit
Signal
green
white
Housing
yellow
+UB
Power Supply
0V
4..20mA Measuring instrument
Shunt
+Signal
-Signal
UB
Parameters
U ≤ 28 V
P ≤ 1 W
Hazardous area
Non-Hazardous area
Generally, any installation, operation, maintenance, or service in hazardous areas is allowed only by authorised personnel and must follow today's directives and regulations.
To amb max. see label (minimum is 60° C)
In accordance to Operating Instruction No. 669746
Warning:
Substitution of components may impair intrinsic safety.
HYDAC ELECTRONIC
66128 Sbr.-Gersweiler Hauptstr.27
HDA4xx -A-xxxx-(xxx)- xx-ggg
Control Drawing
Ex nA; Ex ta,tb,tc; IECEx
18-326-601-4-66 3284
Bl.2/2
A 20.10.09 Hi/Eitel 759907
B 14.11.12 Jo/Eitel 824486
C .
D .
E .
2008 Datum Name
gez. 06.03. U.Hien
gepr.PV 20.10.09 A.Eitel
gepr.EWL 21.10.09 J.Morsch
66..._CONTROL DRAWING\663284-1.PCB (aus 3126)

Anhang: Zertifikat

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx KEM 08.0014X Issue No.:2

Certificate history:
Issue No. 2 (2013-1-25)
Issue No. 1 (2009-7-8)
Issue No. 0 (2008-4-28)

Status: **Current**

Date of Issue: **2013-01-25** Page 1 of 4

Applicant: **Hydac Electronic GmbH**
Hauptstraße 27
66128 Saarbrücken
Germany

Electrical Apparatus: **Pressure Transducer Type HDA 4abc-A-d-(e)-lfg-h-i1 j k**
Optional accessory:

Type of Protection: **Ex ia, Ex ic, Ex nA, Ex ta, Ex tb, Ex tc**

Marking:
Ex ia I Ma
Ex ia IIC T6 Ga, Ex ia IIC T6 Ga/Gb, Ex ia IIC Gb
Ex ic IIC T6/T5/T4 Gc
Ex nA IIC T6/T5/T4 Gc
Ex ia IIIC T85 °C Da
Ex ic IIIC T80/90/100 °C Dc
Ex ta IIIC T80/90/100 °C T_{500}90/100/110 °C Da
Ex tb IIIC T80/90/100 °C Db
Ex tc IIIC T80/90/100 °C Dc

Approved for issue on behalf of the IECEx Certification Body: T. Pijpker

Position: Certification Manager

Signature:
(for printed version)

Date: 2013-01-25

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

DEKRA Certification B.V.
Utrechtseweg 310
6812 AR Arnhem
The Netherlands

DEKRA

IECEx Certificate of Conformity

Certificate No.: IECEx KEM 08.0014X

Date of Issue: **2013-01-25** Issue No.: **2**

Page 2 of 4

Manufacturer: **Hydac Electronic GmbH**
Hauptstraße 27
66128 Saarbrücken
Germany

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2010 Edition: 4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 60079-31 : 2008 Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure 't'

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
NL/KEM/ExTR08.0003/00 NL/KEM/ExTR08.0003/01 NL/KEM/ExTR08.0003/02

Quality Assessment Report:

DE/BVS/QAR06.0017/04

IECEx Certificate of Conformity

Certificate No.: IECEx KEM 08.0014X

Date of Issue: **2013-01-25** Issue No.: **2**

Page 3 of 4

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

Refer to Annex 1 to Certificate of Conformity IECEx KEM 08.0014 X

CONDITIONS OF CERTIFICATION: YES as shown below:

1. Pressure transmitters with an enclosure containing light metals, when used in a potentially explosive atmosphere requiring apparatus of Equipment Protection Level Ga or Ma, shall be installed such, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.

2. For installation of the pressure transmitter between areas where the use of apparatus of Equipment Protection Level Ga or Da is required and areas where the use of apparatus of Equipment Protection Level Gb or Db is required, the following applies:
The internal separation element shall be protected against environmental stress, which might adversely affect the separation element. The material of the separation element shall be obtained from the data supplied by the manufacturer.

Note: These conditions do not apply to equipment of Equipment Protection Levels Gc and Dc

IECEx Certificate of Conformity

Certificate No.: IECEx KEM 08.0014X

Date of Issue: **2013-01-25** Issue No.: **2**

Page 4 of 4

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- Assessment to latest editions of the standards;
- added models in types of protection Ex nA IIC and Ex ic IIC;
- added versions with new electrical and mechanical connections;
- added models in types of protection Ex ta, Ex tb and Ex tc.

Annexe: Annex 1 to CoC KEM 08.0014X-I02.pdf

DEKRA

Annex 1 to Certificate of Conformity IECEx KEM 08.0014X, issue 2

Description

Pressure Transducer Model HDA 4abc-A-d-(e)-lfg-h-i1 j k

where:

a = measurement accuracy (1, 3, 4, 7 or 8)
b = mechanical connection (process) (1, 2, 3, 4, 5, 6, 7, 8, 9, A, C, E, F, G, H, K, L, M ... Y, W, Z)
c = electrical connection 1, C,D,E = fixed cable, flying leads
2 ... 8, F, H, K, L, M, N, S, V = several types of connectors
9, G = 1/2" NPT conduit connection (male)
A = connector with 1/2" NPT female adapter
other letters free for future use
d = measuring range (5 digits, bar or PSI) up to 1000 bar max. (15000 psi max.)
e = mechanical connection (b = Z) alphanumerical code (3 digits)
f = isolation variants H = 500 Vac isolation from enclosure
N = 125 Vac isolation from enclosure (functional only)
g = approval variants 1 = Ex ia I Ma and
Ex ia IIC T6 Ga and
Ex ia IIC T6 Ga/Gb and
Ex ia IIC T6 Gb
2 = Ex ia I Ma and
Ex ia IIC T6 Gb
3 = Ex ia IIC T6 Gb
4 = Ex ia IIC T6 Ga and
Ex ia IIC T6 Gb
5 = Ex ia I Ma
9 = Ex nA IIC T6, T5, T4 Gc
A = Ex ta IIIC T80 °C T_{500} 90 °C or T90 °C T_{500} 100 °C or
T100 °C T_{500} 110 °C Da and
Ex tb IIIC T80 °C or T90 °C or T100 °C Db
B = Ex tc IIIC T80 °C or 90°C or T100°C Dc
C = Ex ic IIC T6, T5, T4 Gc and
Ex ic IIIC T80 °C or T90 °C or T100 °C Dc
D = Ex ia I Ma and
Ex ia IIC T6 Ga and
Ex ia IIC T6 Ga/Gb and
Ex ia IIC T6 Gb
Ex ia IIIC T85 °C Da
h = indication for modifications (3 digits); 000 for standard version
i = sealing material E = EPDM sealing *)
F = FPM sealing *)
1 = stainless steel *)
medium connection
j = (psi) for psi version (not applicable for bar version)
k = length of cable, if applicable, in cm or inch as indicated

*) only applicable for models with a = 1 or 3

Form 124
Version 1 (2011-02)

DEKRA Certification B.V. Utrechtseweg 310, 6812 AR Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
T +31 26 3 56 20 00 F +31 26 3 52 58 00 www.dekra-certification.com Registered Arnhem 09085396

DEKRA

Annex 1 to Certificate of Conformity IECEx KEM 08.0014X, issue 2

Pressure Transducer Series HDA 4... is used for conversion of a pressure signal into a proportional electrical signal (4 - 20 mA current signal).
The electrical components of the transducer are completely encapsulated within a metal enclosure; the electrical connections are done by a connector or via a permanently connected cable.
All variations of electrical connections are allowed for the intrinsically safe versions.

The enclosure of the pressure transmitters type HDA 4...-A-.....-(...)-I.g-... (with g = 9, A, B or C) provides a degree of protection of at least IP64 in accordance with IEC 60529.

Thermal data

Ambient temperature range:
- apparatus in types of protection Ex ia I, Ex ia IIC and Ex ia IIIC: -40 °C to +60 °C;
- apparatus in types of protection Ex ic IIIC, Ex ta IIIC, Ex tb IIIC and Ex tc IIIC: -40 °C to +80 °C;
- apparatus in types of protection Ex nA IIC, and Ex ic IIC: -40 °C to +85 °C.

The temperature class and the maximum surface temperature T and T_{500} are depending on the maximum ambient temperature:

Maximum ambient temperature	Temperature class	Max surface temperature T	Max surface temperature T_{500}
60 °C	T6	80 °C	90 °C
70 °C	T5	90 °C	100 °C
80 °C		100 °C	110 °C
85 °C	T4		

Electrical data

Intrinsically safe versions:

Supply/output circuit (connections + and -):
in type of protection intrinsic safety Ex ia I, Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 28 V; I_i = 100 mA; P_i = 1 W; C_i = 22 nF; L_i = 0 mH.

From a safety point of view, the supply/output circuit of pressure transmitters type HDA 4...-A-...-(...)-IN.-...-.... shall be considered to be connected to earth.

Other versions:

Supply/output circuit (connections + and -):
U ≤ 28 V: P ≤ 1 W.

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IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx TSA 09.0041X issue No.:0	Certificate history:
Status:	**Current**	
Date of Issue:	**2010-01-20**	Page 1 of 3
Applicant:	**Hydac Pty Ltd** 109-111 Dohertys Road North Altona Victoria, 3025 **Australia**	
Electrical Apparatus: *Optional accessory:*	**Pressure Transducer Type HDA 4abc-A-d-lef-g-h1i j**	
Type of Protection:	**Ex ia I, Ex ia IIC, Ex iaD, Ex tD**	
Marking:	**HYDAC ELECTRONIC** **HDA 4abc-A-d-lef-g-h1ij** **Ex ia I or Ex ia IIC T6 or Ex ia IIC T6 Ga or** **Ex iaD 20 IP6X T85 C Da or Ex tD A21 IP6X T85 C Db** **IECEX TSA 09.0041X** **Serial No. XXXXXXXXX**	
Approved for issue on behalf of the IECEx Certification Body:	Ujen Singh	
Position:	Quality & Certification Manager	
Signature: *(for printed version)*		
Date:	20 JANUARY 2010.	

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

TestSafe Australia
919 Londonderry Road
Londonderry NSW 2753
Australia

IECEx Certificate of Conformity

Certificate No.: IECEx TSA 09.0041X

Date of Issue: **2010-01-20** Issue No.: **0**

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Manufacturer: **Hydac Electronic GmbH**
Hauptstraße 27
66128 Saarbrucken
Germany

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 61241-0 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-1 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"
IEC 61241-11 : 2005 Edition: 1	Electrical apparatus for use in the pressence of combustible dusts - Part 11: Protection by intrinsic safety 'iD'

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

NL/KEM/ExTR08.0003/00
NL/KEM/ExTR08.0003/01

Quality Assessment Report:
DE/BVS/QAR06.0017/02

IECEx Certificate of Conformity

Certificate No.: IECEx TSA 09.0041X

Date of Issue: **2010-01-20** Issue No.: **0**

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Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

Pressure Transducer Series HDA 4... is used for conversion of a pressure signal into a proportional electrical signal (4-20 mA current signal)
The electrical components of the transducer are completely encapsulated within a metal enclosure. The electrical connections are done by a connector or via a permanently connected cable.
All variations of electrical connections are allowed for the intrinsically safe versions.
Refer Annexe for details of models.

CONDITIONS OF CERTIFICATION: YES as shown below:

Refer Annexe for details of parameters.

HYDAC ELECTRONIC GMBH

Hauptstraße 27

D-66128 Saarbrücken

Germany

Web: www.hydac.com

E-Mail: electronic@hydac.com

Tel.: +49-(0)6897-509-01

Fax: +49-(0)6897-509-1726

HYDAC Service

Für Fragen zu Reparaturen steht Ihnen der HYDAC Service zur Verfügung:

HYDAC SERVICE GMBH

Hauptstr. 27

D-66128 Saarbrücken

Germany

Tel.: +49-(0)6897-509-1936

Fax: +49-(0)6897-509-1933

Anmerkung

Die Angaben in diesem Handbuch beziehen sich auf die beschriebenen Betriebsbedingungen und Einsatzfälle. Bei abweichenden Einsatzfällen und/oder Betriebsbedingungen wenden Sie sich bitte an die entsprechende Fachabteilung.

Bei technischen Fragen, Hinweisen oder Störungen nehmen Sie bitte Kontakt mit Ihrer HYDAC- Vertretung auf.

Technische Änderungen sind vorbehalten.

HYDAC ELECTRONIC

Operating Instructions
Pressure Transmitter Series HDA 4000
with IECEx-Approval

(translation of the original instructions)

Protection types and zones:

Ex	ia	I	Ma
Ex	ia	IIC	T6 Ga
Ex	ia	IIC	T6 Ga/Gb
Ex	ia	IIC	T6 Gb
Ex	ic	IIC	T6/ T5/T4 Gc
Ex	nA	IIC	T6/ T5 T4 Gc
Ex	ia	IIIC	T85°C Da
Ex	ic	IIIC	T80/90/100 °C Dc
Ex	ta	IIIC	T80/90/100 °C Da T_{500} 90/100/110 °C Da
Ex	tb	IIIC	T80/90/100 °C Db
Ex	tc	IIIC	T80/90/100 °C Dc

Certificate Nr.: IECEx KEM 08.0014X
IECEx TSA 09.0041X

Inspection unit: DEKRA

Table of Contents

1. General

If you have any queries regarding technical details or the suitability of the unit for your application, please contact our **Technical Sales Department**. The series HDA 4000 pressure transmitters are individually tested and calibrated at a computer operated test station. They are maintenance-free and operate perfectly when used according to the data (see Technical Specifications). However, if there is a cause for complaint, please contact **HYDAC Service**. Interference by anyone other than HYDAC personnel will invalidate all warranty claims plus the IECEx approvals.

2. Function

The pressure signal measured by the sensor is converted into a proportional analog 4..20 mA signal Connection to the power supply is done via a plug connector or a permanently attached line.

3. Installation and commissioning Information

The pressure transmitters can be installed directly on the process side via the threaded connection. It is important to ensure that the membrane is protected from mechanical damage. This is particularly relevant for instruments with a flush membrane.

In order to prevent mechanical damage when dealing with critical applications involving heavy vibrations or blows, for example, we recommend securing the unit with an elastomer clamp and decoupling the hydraulic ports via a Minimess hose.

Tightening torque see dimensions.

Pressure transmitters with a rated pressure of < 100 bar (≤ 1500 psi) provide for pressure equalization with the ambient pressure. This is enabled by a small hole underneath the plug connector. The connector is covered on the inside by a special membrane which prevents moisture from seeping into the unit from the outside. In order to prevent the hole from becoming clogged, mounting should be done in a horizontal position in moist or dusty environments, or vertically with the pressure port pointing downwards.

On units with a rated pressure of < 100 bar (≤ 1500 psi) and a ½“ Conduit electrical connection, the pressure equalization with single conductor is realized by means of a short vent line, using insulated cables, it is realized by means of a cable with an integrated venting hose. It must be ensured that the venting only takes place outside the hazardous area.

Connection is to be done by a properly qualified specialist in accordance with the pertinent regulations pertaining to potentially explosive environments (e.g. EN 60079-14).

The series 4000 pressure transmitters carry the CE -mark. The certificate of conformity can be found in the annex.

The requirements of the standards (see technical data) cannot be satisfied unless the pressure transmitter housing is properly grounded via the mechanical connection or the ½ NPT Conduit. If a green-yellow wire is available, it can be used additionally for grounding, but may not be used on its own as the grounding connection. When using hose mounting the housing has to be grounded separately.

The related intrinsically safe devices (e.g. zener barriers) must also be grounded. A potential equalization is required along the intrinsically safe electrical circuit in the N type model (insulation valtage ≤ 50 VAC).

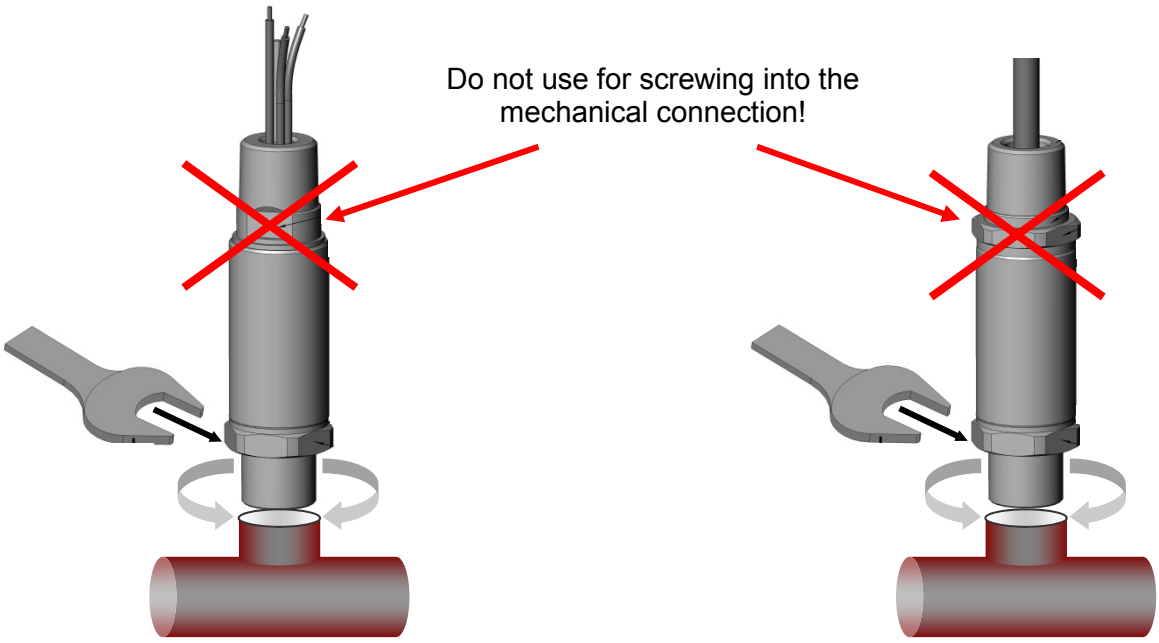
On the HDA 4000 series, type H (insulation voltage ≤ 500 VAC), the cable length to the pressure transmitter must be max. 30 m (overvoltage protection to DIN EN 61000-6-2). If the cable length exceeds 30 m, overvoltage protection must be provided by the customer.

4.Important mounting instructions for Conduit connection

4.1 Installation Instructions for units with 1/2 “ NPT Conduit

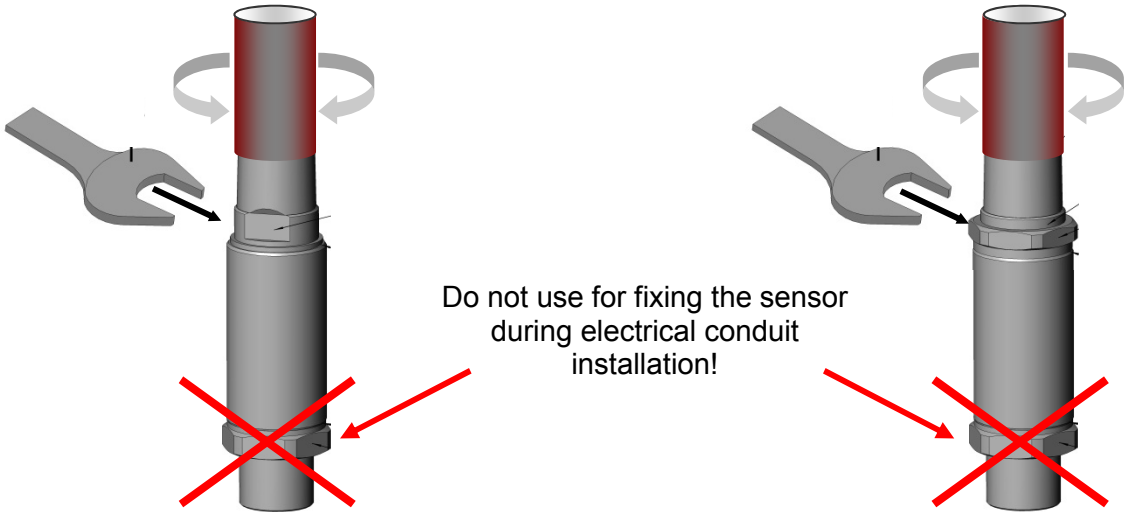
Mechanical Installation

The process installation of the transmitters may only be carried out utilizing the hex.27mm flats on the process connection side.



Electrical Installation

The electrical installation of the transmitter may only be carried out utilizing the hex.27mm flats on the 1/2 NPT conduit (cable outlet)



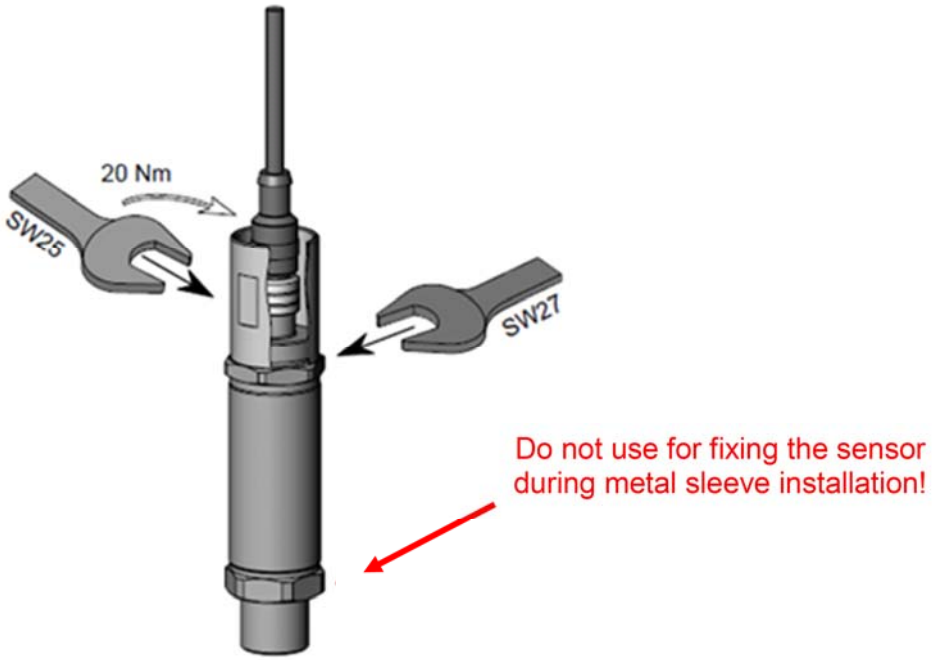
4.2 Installation Instructions for units with impact protection

Installation instructions for units with M12x1 connector with an impact protected metal safety sleeve for use in zones:
Ex nA IIC T6 Gc
Ex ta IIIC T80°C T_{500}T90°C Da
Ex tb IIIC T80°C Db
By adherence to safety guidelines in the protection rating and applications: the usage of the impact protected metal safety sleeve is stringently required.

The electrical installation of the transmitter may only be carried out utilizing the hex.27mm flats on the installation of the impact protected metal safety sleeve.

The impact protected metal safety sleeve must be tightened with a torque of 20 Nm.

The connection of the cable with M12x1 plug may only be carried out in voltage-free condition and in combination with the impact protected metal safety sleeve. Also the separation of the M12x1 connector may only be carried out if the system is in dead state.



5. Safety Information

The pressure transmitter may no longer be used when the label becomes illegible.
Intrinsic safety barriers with protection type „ia“ are to be used for connecting to the pressure transmitters.

The seals and gaskets are to be checked to see that they function properly prior to mounting and at regular intervals in keeping with the climatic conditions and the influence of the media, and to be changed as needed. Replacement seals and gaskets can be obtained from HYDAC ELECTRONIC GMBH. (Standard seal see technical data) This check is to be conducted at least every three years.

HDA 41xx / 43xx with ceramic measurement cell:

When used simultaneously in zones 0 and 1, the ceramic measurement membrane of the pressure transmitters functions as an “isolating wall” between zone 0 and 1. The thickness of this “isolating wall” is generally ≤ 1 mm, and ≤ 0.2 mm for rated pressures below 1 bar. This isolating function is to be ensured in any event by checking the compatibility of the media being measured and the materials used to make the pressure transmitter; the overload and bursting pressures are also to be adhered to (for details, see Technical Specifications).

HDA 44xx / 47xx with stainless steel membrane:

When used simultaneously in zones 0 and 1, the metal measurement membrane of the pressure transmitters functions as an “isolating wall” between zone 0 and 1. The thickness of this “isolating wall” is generally ≤ 1 mm, and ≤ 0.2 mm for rated pressures below 100 bars. This isolating function is to be ensured in any event by checking the compatibility of the media being measured and the materials used to make the pressure transmitter; the overload and bursting pressures are also to be adhered to (for details, see Technical Specifications).It is imperative that the measurement fluid is compatible with the materials used in the pressure transmitter; similarly, the overload pressures and bursting pressures must be adhered to without fail (for these specifications, see the “Technical Specifications” and “Safety Information” of the EC type examination certificate).
The internal measurement membrane of the pressure transmitter is to be protected against mechanical damage. This applies especially for transmitters with flush membrane if the unit is used simultaneously in zones 0 and 1 equally zones 1 and 2.
It is imperative that the measurement fluid is compatible with the materials used in the pressure transmitter; similarly, the overload pressures and bursting pressures must be adhered to without fail (for these specifications, see the “Technical Specifications” and “Safety Information” of the EC type examination certificate).

The internal measurement membrane of the pressure transmitter is to be protected against mechanical damage. This applies especially for transmitters with flush membrane if the unit is used simultaneously in zones 0 and 1 equally zones 1 and 2

The transfer media between the flush membrane and the internal measurement membrane is paraffin oil (white oil, S933).
Please ensure sufficient sealing between the zones as well.

The data pe*rtaining* to use in Hazardous Location is to be heeded in any event.

Operation is only permitted when operational and process related intensive electrostatic changes are eliminated.

When used in atmospheres containing combustible dusts, the pressure transmitter must be installed in such a way that it is protected from damage and knocks.

From a safety point of view, the supply / output circuit of pressure transmitter shall be considered to be connected to earth.

By adherence to safety guidelines in the protection rating and applications:
Ex nA IIC T6 Gc / Ex ta IIIC T80°C T_{500}T90°C Da und Ex tb III C T80°C Db
the usage of the impact protected metal safety sleeve (for M12x1 connector) is stringently required. The impact protected metal safety sleeve must be tightened with a torque of 20 Nm.

Operations in areas requiring category 1G equipment, are only permitted when operational and process related intensive electrostatic charges are eliminated.

6. Technical Data

Input data		**HDA 4100 (Absolute pressure)**						**HDA 4300 (Relative pressure)**			
		absolute and relative		relative							
Measuring Ranges	bar	1	2.5	-1 .. 1	-1 .. 9	4	6	10	16	25	40
Overload ranges	bar	3	8	3	32	12	20	32	50	80	120
Burst pressure	bar	5	12	5	48	18	30	48	75	120	180
		absolute and relative			relative						
Measuring Ranges	psi	15	30	50	100	150	250	500			
Overload ranges	psi	45	100	150	290	450	725	1500			
Burst pressure	psi	70	150	250	400	650	1000	2500			
Mechanical connection		see model code / dimensions									
Tightening torque		See dimensions									
Parts in contact with fluid					**Standard**			**Flush membrane**			
		Sensor:			Ceramic			Ceramic			
		Connector:			1.4301			1.4301; 1.4435			
		Seal:			FPM/ EPDM			FPM			
		O-ring						FPM			
Pressure transfer fluid								Silicon-free oil			
Output data											
Output signal		4 .. 20 mA (2-conductor), $R_{Lmax.} = (U_B - 12\ V) / 20\ mA\ [k\Omega]$									
Curve deviation at max. setting to DIN 16086 (accuracy class)	Typ. max.	≤ ± 0.5 % FS ≤ ± 1.0 % FS						≤ ± 0.5 % FS ≤ ± 1.0 % FS			
Curve deviation at min. setting (B.F.S.L.)	Typ. max.	≤ ± 0.25 % FS ≤ ± 0.5 % FS						≤ ± 0.25 % FS ≤ ± 0.5 % FS			
Temperature compensation zero point	Typ. max.	≤ ± 0.02 % / °C ≤ ± 0.03 % / °C						≤ ± 0.02 % / °C ≤ ± 0.03 % / °C			
Temperature compensation Over range	Typ. Max	≤ ± 0.02 % / °C ≤ ± 0.03 % / °C						≤ ± 0.02 % / °C ≤ ± 0.03 % / °C			
Non-linearity at max. setting to DIN 16086	max.	≤ ± 0.5 % FS						≤ ± 0.5 % FS			
Hysteresis	max.	≤ ± 0.4 % FS						≤ ± 0.4 % FS			
Repeatability		≤ ± 0.1 % FS						≤ ± 0.1 % FS			
Rise time		≤ 1.5 ms						≤ 1.5 ms			
Long term drift	Typ.	≤ ± 0.3 % FS / year						≤ ± 0.3 % FS / year			
Ambient conditions											
Compensated temperature range		-20 .. + 85 °C									
Operating temperature range		-20 .. + 60 °C									
Storage temperature range		-40 .. +100 °C									
Fluid temperature range [1)]		-40 .. + 60 °C/ -20 .. + 60 °C									
CE Marked		EN 61000-6-1 /2 /3 /4 IEC 60079-0 /11 /26 /36									
Vibration resistance to IEC 68-2-6 at 10 ..500Hz		≤ 20 g									
Protection class to IEC 60529		IP 65 (connector EN175301-803 (DIN 43650) and Binder 714 M18) IP 67 (M12x1 male connector, for use with IP 67 female connector)									
Relevant data for Ex applications		**Ex ia, ic**						**Ex nA, ta, tb, tc**			
Supply voltage		U_i = 12 .. 28V						12 .. 28 V DC			
Maximum input current		Ii = 100 mA									
Maximum input power		P_i = 1W						max. power consumption ≤ 1W			
Capacity of transmitter		C_i ≤ 22 nF									
Inductance of transmitter		Li = 0 mH									
Insulation voltage		50 V AC with integrated overvoltage protection EN 61000-6-2 or 500 V AC, depending on the model (see model code)									
Other data											
Reverse polarity protection of the supply voltage, short circuit protection		Standard									
Residual ripple supply voltage		≤ 5 %									
Service life		> 10 million cycles									
Weight		approx. 180 g									

Note: FS (**F**ull **S**cale) = relative to the full measuring range
B.F.S.L = **B**est **F**it **S**traight **L**ine
[1)]-20 °C with FPM or EPDM seal, -40 °C on request

Input data		**HDA 4400**						**HDA 4700**					
Measuring Ranges	bar	-1..5	-1..9	6	16	40	60	100	160	250	400	600	1000
Overload ranges	bar	15	20	15	32	80	120	200	320	500	800	900[1)]	1600
Burst pressure	bar	100	100	100	200	200	300	500	800	1000	2000	2000	3000
Measuring Ranges	psi	100	150	200	300	500	600	700	750	1000			
	psi	1500	2000	3000	5000	6000	9000	10000	15000				
Overload ranges	psi	290	290	460	1160	1160	1160	1740	1740	2900			
	psi	2900	4600	7250	11600	11600	14500	14500	23200				
Burst pressure	psi	1450	1450	2900	2900	2900	2900	4350	4350	7250			
	psi	7250	11600	14500	29000	29000	29000	29000	43500				

Mechanical connection		see model code / dimensions		
Tightening torque		See dimensions		
			Standard	**Flush membrane**
		Stainless steel	1.4435; 1.4301	1.4435; 1.4301
		Seal	FPM	FPM
		O-ring		FPM
Pressure transfer fluid				Silicon-free oil

Output data			
Output signal		4 .. 20 mA (2-conductor), $R_{Lmax.} = (U_B – 12\ V) / 20\ mA\ [k\Omega]$	
Curve deviation at max. setting to DIN 16086 (accuracy class)	Typ. Max.	≤ ± 0.5 % FS ≤ ± 1.0 % FS	≤ ± 0.25 % FS ≤ ± 0.5 % FS
Curve deviation at min. setting	Typ. max.	≤ ± 0.25 % FS ≤ ± 0.5 % FS	≤ ± 0.15 % FS ≤ ± 0.25 % FS
Temperature compensation Zero point	Typ. max.	≤ ± 0.015 % / °C ≤ ± 0.025 % / °C	≤ ± 0.008 % / °C ≤ ± 0.015 % / °C
Temperature compensation Over range	Typ. max.	≤ ± 0.015 % / °C ≤ ± 0.025 % / °C	≤ ± 0.008 % / °C ≤ ± 0.015 % / °C
Non-linearity at max. setting to DIN 16086	max.	≤ ± 0.3% FS	≤ ± 0.3 % FS
Hysteresis	max.	≤ ± 0.4 % FS	≤ ± 0.1 % FS
Repeatability		≤ ± 0.1 % FS	≤ ± 0.05 % FS
Rise time		≤ 1.5 ms	≤ 1.5 ms
Long term drift	Typ.	≤ ± 0.3 % FS / year	≤ ± 0.1 % FS / year

Ambient conditions			
Compensated temperature range		-20 .. + 85°C	
Operating temperature range[2)]		-20 .. + 60 °C	-40 .. + 60 °C / -20 .. + 60 °C
Storage temperature range		-40 .. +100 °C	
Medium temperature range[2)]		-40 .. + 60 °C / -20 .. + 60 °C	
CE Marked		EN 61000-6-1/2/3/4 IEC 60079-0/11/26/36	
Vibration resistance to IEC 68-2-6 at 10 ..500Hz		≤ 20 g	
Protection class to IEC 60529		IP 65 (connector EN175301-803 (DIN 43650) and Binder 714 M18) IP 67 (M12x1 male connector, for use with IP 67 female connector)	
Relevant data for Ex Application		**Ex ia, ic**	**Ex nA, ta, tb, tc**
Supply voltage		U_i = 12 .. 28V	12 .. 28 V
Max. input current		Ii = 100 mA	
Maximum input power		P_i = 1W	max. power consumption ≤ 1W
Capacity of transmitter		C_i ≤ 22 nF	
Inductance of transmitter		Li = 0 mH	
Insulation voltage		50 V AC with integrated overvoltage protection EN 61000-6-2 or 500 V AC, depending on the model (see model code)	

Other data		
Reverse polarity protection of the supply voltage, short circuit protection excess voltage		Standard
Residual ripple supply voltage		≤ 5 %
Service life		> 10 million cycles
Weight		ca. 150 g (Standard) ca. 180 g (flush mount version)

Note: FS (**F**ull **S**cale) = relative to the full measuring range
B.F.S.L = **B**est **F**it **S**traight **L**ine

[1)] Standard overload range 1000 bar, flush mount version overload range 900 bar
[2)] -25°C with FPM seal, -40°C on request

7. Model code

7.1 Standard

Model code HDA 4100 / HDA 4300

HDA 4 X X X - A - XXXXX - I X X - XXX - X1 (psi) XX inch

Accuracy

1 = 1% FS max., ceramic absolute
3 = 1% FS max., ceramic relative

Mechanical connection

4 = G 1/4 A DIN 3852, male
5 = 7/16-20 UNF 2B (SAE 4), female
6 = 7/16-20 UNF 2A (SAE 4), male
7 = 9/16-18 UNF 2A (SAE 6), male
8 = 1/4-18 NPT, male
C = SF250CX, Autoclave (7/16-20 UNF 2B), female
F = 1/4-18 NPT, female

Electrical connection

1 = flying leads
4 = Male connector, Binder series 714 M18, 4 pole
5 = Male connector, DIN 43650, 3 pol. + PE
6 = Male connector M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (male)
A = Male connector EN 175301-803(DIN 43650),
3 pole + PE, 1/2" Conduit female

Signal

A = 4 .. 20 mA

Measuring Ranges

Measuring ranges are shown in bar or psi (in case of psi see additional psi declaration in model code)

Approval

I = IECEx (Details please see description of approvals)

Insulation voltage

H = 500 V AC to housing
N = 50 V AC to housing

Protection types and applications:(see Tab.,chap.7.3)

1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modification number

000 = Standard
(other numbers are used for e.g.: version, orifice, pin connection, plug at the end of the free cable)

Seal material (parts in contact with the fluid)

F = FPM-Dichtung (e.g. for hydraulic oils)
E = EPDM-seal (e.g. for coolant)

Material of connection (parts in contact with the fluid)

1 = stainless steel

(psi)

Additional declaration for psi version (escaped for bar version)

Cable length (e.g. for Conduit connection or flying leads

Shown in cm or inch

Model code HDA 4400 / HDA 4700

HDA 4 X X X - A - XXXXX - I X X - XXX (psi) XX inch

Accuracy
4 = 1% FS max.
7 = 0.5% FS max.

Mechanical connection
2 = G 1/2 DIN 3852
4 = G 1/4 A DIN 3852, male
5 = 7/16-20 UNF 2B (SAE 4), female
6 = 7/16-20 UNF 2A (SAE 4), male
7 = 9/16-18 UNF 2A (SAE 6), male
8 = 1/4-18 NPT, male
C = SF250CX, Autoclave (7/16-20 UNF 2B), female
F = 1/4-18 NPT, female

Electrical connection
1 = flying leads
4 = Male connector, Binder series 714 M18, 4 pole
5 = Male connector, DIN 43650, 3 pol. + PE
6 = Male connector M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (male)
A = Male connector EN 175301-803(DIN 43650),
3 pole + PE, 1/2" Conduit female

Signal
A = 4 .. 20 mA

Measuring ranges
Measuring ranges are shown in bar or psi (in case of psi see additional psi declaration in model code)

Approval
I = IECEx (Details please see description of approvals)

Insulation voltage
H = 500 V AC to housing
N = 50 V AC to housing

Protection types and applications:(see Tab.,chap.7.3)
1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modification number
000 = Standard
(other numbers are used for e.g.: version, orifice, pin connection, plug at the end of the free cable)

(psi)
Additional declaration for psi version (escaped for bar version)

Cable length (e.g. for Conduit connection or flying leads
Shown in cm or inch

7.2 Model Code (flush mount version)

Model code HDA 4100 / HDA 4300

HDA 4 X X X - A - XXXXX - XXX- I X X - XXX - X1 (psi) XX inch

Accuracy

1 = 1% FS max., ceramic absolute
3 = 1% FS max., ceramic relative

Mechanical Process Connection

Z = flush membrane

Electrical connection

1 = flying leads
4 = Male connector, Binder series 714 M18, 4 pole
5 = Male connector, DIN 43650, 3 pol. + PE
6 = Male connector M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (male)
A = Male connector EN 175301-803(DIN 43650),
3 pole + PE, 1/2" Conduit female

Signal

A = 4 .. 20 mA

Measuring Ranges

Measuring ranges are shown in bar or psi (in case of psi see additional psi declaration in model code)

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 (Details please see description of approvals)

Insulation voltage

H = 500 V AC to housing
N = 50 V AC to housing

Protection types and applications:(see Tab.,chap.7.3)

1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modification number

000 = Standard
(other numbers are used for e.g.: version, orifice, pin connection, plug at the end of the free cable)

Seal material (parts in contact with the

F = FPM-Dichtung (e.g. for hydraulic oils)
E = EPDM-seal (e.g. for coolant)

Material of connection (parts in contact with the fluid)

1 = stainless steel

(psi)

Additional declaration for psi version (escaped for bar version)

Cable length (e.g. for Conduit connection or flying leads

Shown in cm or inch

Model Code HDA 4400 / HDA 4700

HDA 4 X X X - A - XXXXX - XXX - I X X - XXX (psi) XX inch

Accuracy

4 = 1% FS max.
7 = 0.5% FS max.

Mechanical Process Connection

Z = flush membrane

Electrical connection

1 = flying leads
4 = Male connector, Binder series 714 M18, 4 pole
5 = Male connector, DIN 43650, 3 pol. + PE
6 = Male connector M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (male)
A = Male connector EN 175301-803(DIN 43650), 3 pole + PE, 1/2" Conduit female

Signal

A = 4 .. 20 mA

Measuring ranges

Measuring ranges are shown in bar or psi (in case of psi see additional psi declaration in model code)

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 (Details please see description of approvals)

Insulation voltage

H = 500 V AC to housing
N = 50 V AC to housing

Protection types and applications:(see Tab.,chap.7.3)

1 = Ex ia I Ma / Ex ia IIC T6 Ga / Ex ia IIC T6 Ga/Gb / Ex ia IIC T6 Gb
9 = Ex nA IIC T6 Gc
A = Ex ta IIIC T80°C T_{500}T90°C Da / 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 IIIC T85°C Da

Modification number

000 = Standard
(other numbers are used for e.g.: version, orifice, pin connection, plug at the end of the free cable)

(psi)

Additional declaration for psi version (escaped for bar version)

Cable length (e.g. for Conduit connection or flying leads

Shown in cm or inch

7.3 Evaluation table: Classification of the protection types and applications

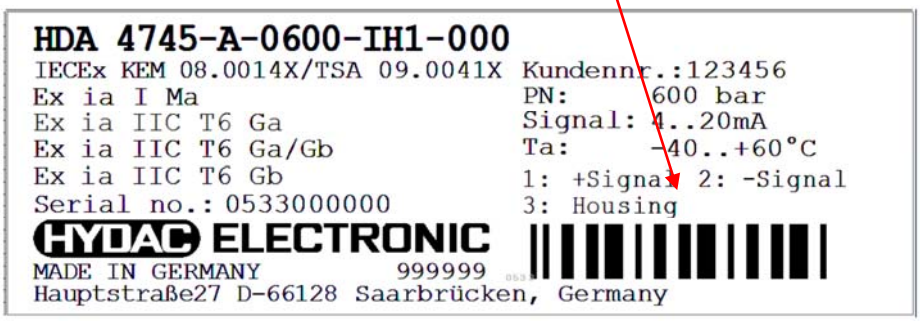
Protection types and applications			Ex ia I Ma	Ex ia IIC T6 Ga Ex ia IIC T6 Ga/Gb	Ex ia IIC T6 Gb	Ex nA IIC T6 Gc	Ex ta IIIC T80°C T_{500}T90°C Da Ex tb IIIC T80°C Db	Ex ic IIC T6 Gc Ex ic IIIC T80°C Dc	Ex ia IIIC T85° C Da
Zones / Categories			Equipment protection level Ma Mining Protection class: Intrinsically 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
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	✓					✓			
A	✓						✓		
C	✓							✓	
D	✓		✓	✓	✓				✓

7.4 Serial number

The serial number includes the calendar week and year of manufacture of the unit, adjacent to the sequential serial number.

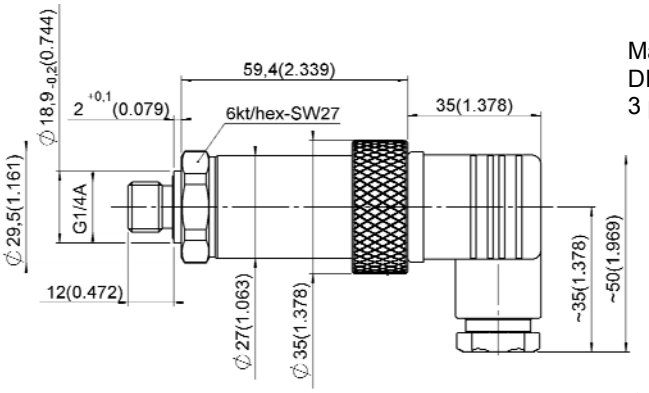
Configuration of serial number (SN): xxyykzzzzzz

XX	Manufacturing date	e.g. : 3 → 2013
yy	Calendar week	e.g. : 10→ KW 10
k	Change control status	e.g. : A
zzzzzz	Sequential serial number	e.g. : 000001



8. Dimensions

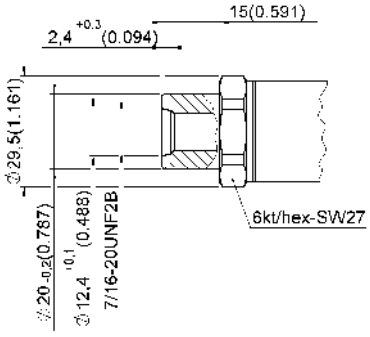
DIN 3852-E-G1/4A , male
Torque value: 20 Nm



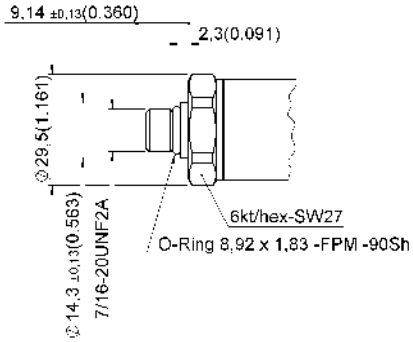
Male connection
DIN 43650
3 pole + PE

8.1. Mechanical connection variants

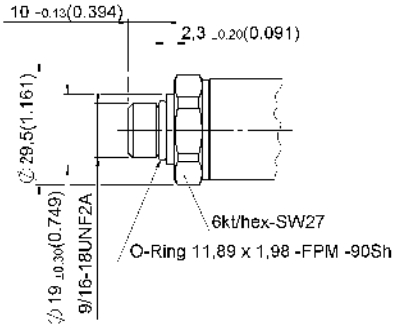
7/16-20 UNF 2B (SAE 4),
female
Torque value: 15 Nm



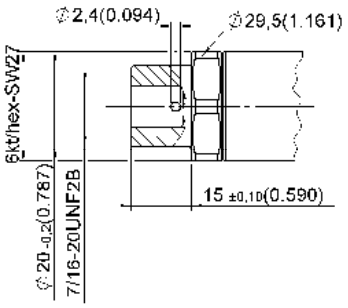
7/16-20 UNF 2A (SAE 4),
male
Torque value: 15 Nm



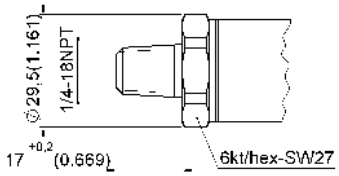
9/16-18 UNF 2A (SAE 6),
Male
Torque value: 20 Nm



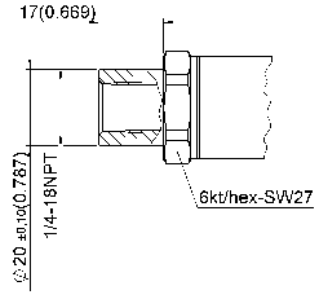
SF 250CX, Autoclave
(7/16-20 UNF 2B), female
Torque value: 15 Nm



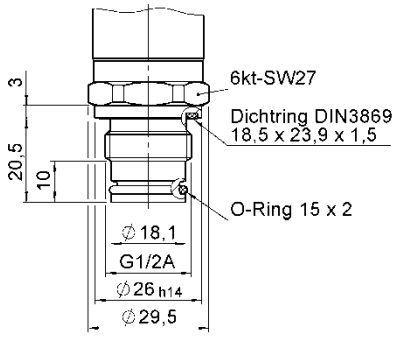
1/4-18 NPT,
Male
Torque value max. 40 Nm



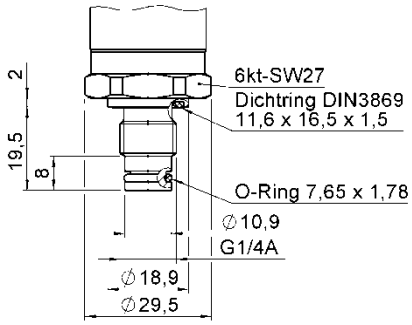
1/4-18 NPT,
female
Torque value: max. 40 Nm



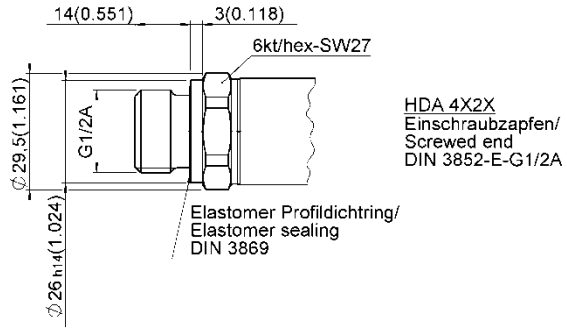
G 1/2 with additional front O-ring-seal,
Torque value: max. 45 Nm



G 1/4 with additional front O-ring-seal
Torque value: max. 20 Nm

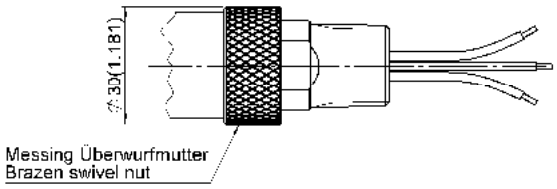


G 1/2 A DIN 3852
Torque value: max. 45 Nm

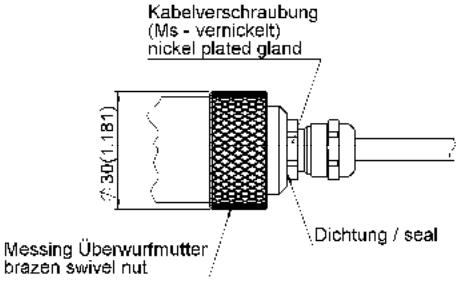


8.2. Electrical connection variants:

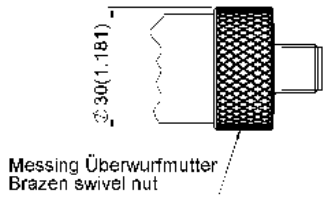
1/2-14 NPT Conduit (male)



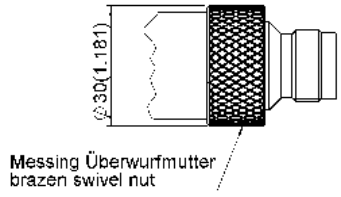
Flying leads



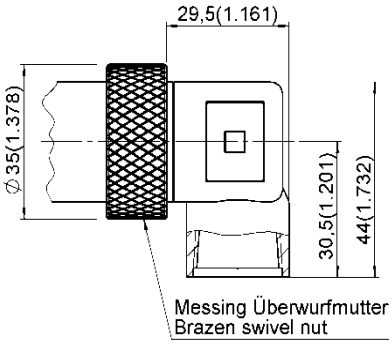
Male Connection, M12x1, 4 pol.



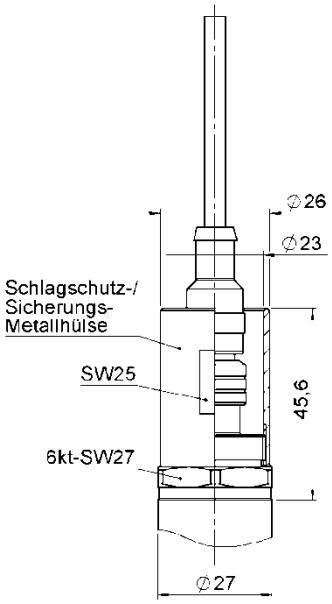
Male connection, Binder series 714 M18, 4 pol.



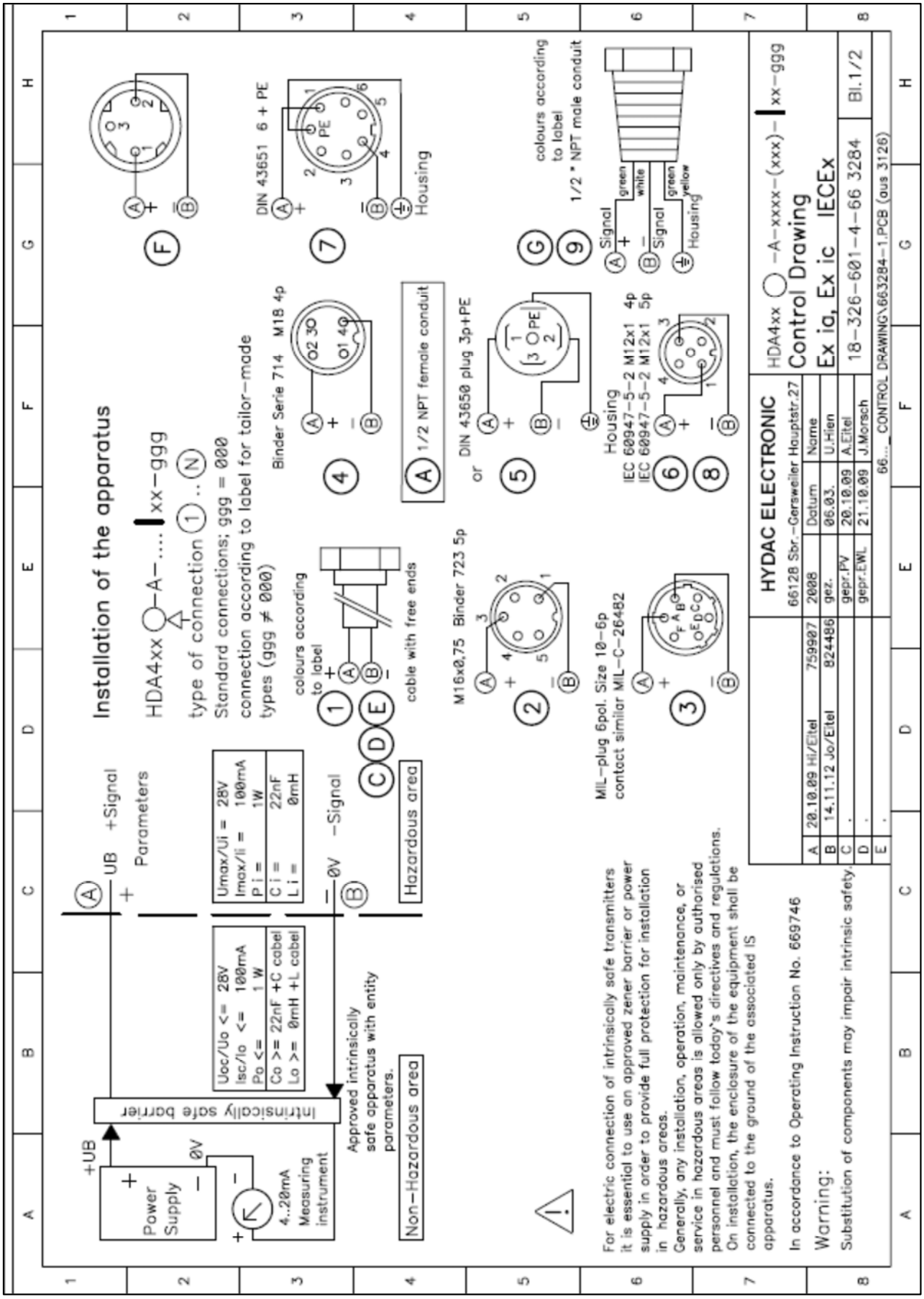
Male connector, DIN 43650, 3 pol. + PE
1/2" Conduit female

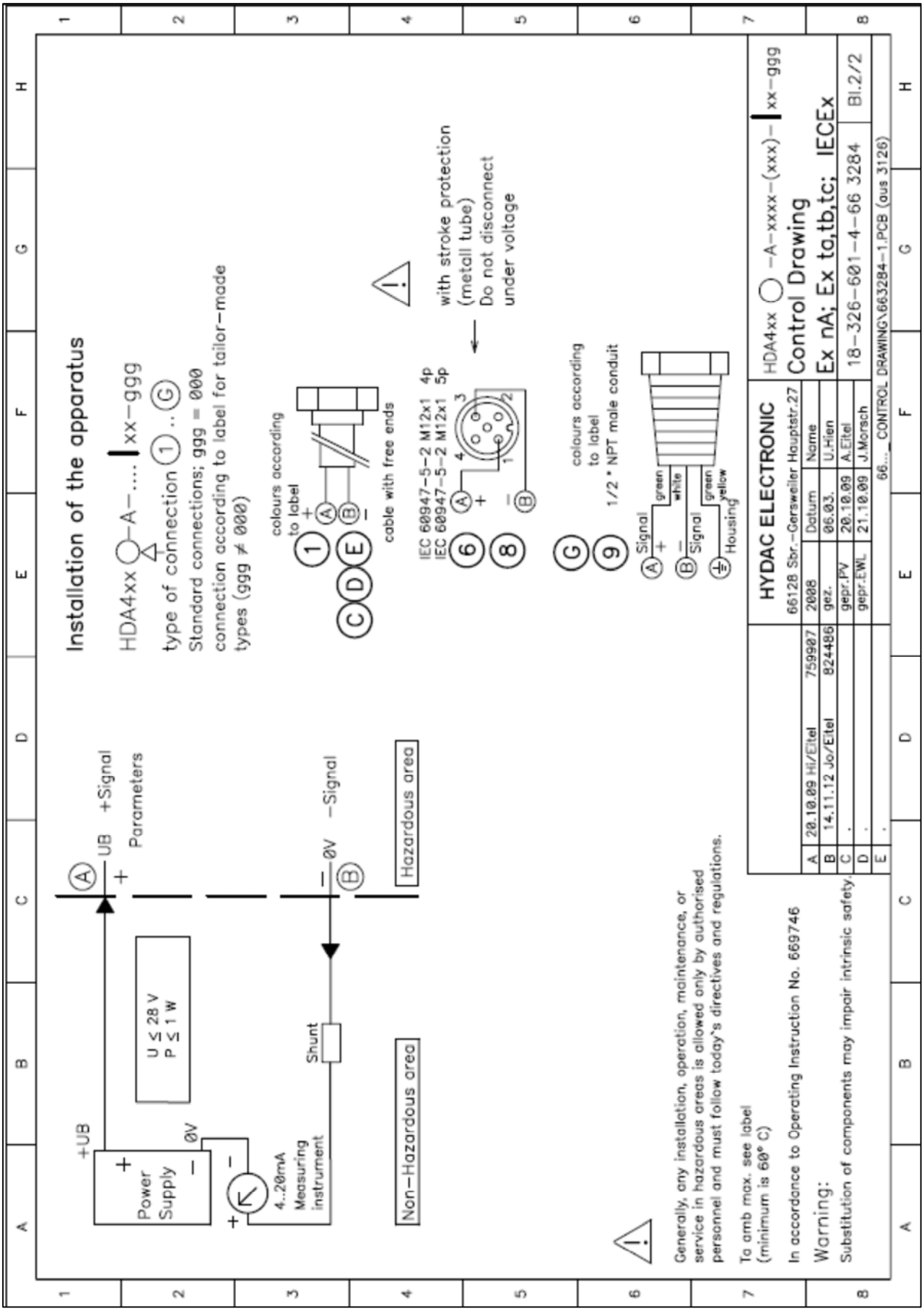


Impact protected metal safety sleeve:



9. Control-Drawing




Installation of the apparatus
HDA4xx –A–.... xx–ggg
type of connection 1 .. G
Standard connections; ggg = 000
connection according to label for tailor–made types (ggg ≠ 000)
colours according to label
cable with free ends
IEC 60947–5–2 M12x1 4p
IEC 60947–5–2 M12x1 5p
with stroke protection (metall tube)
Do not disconnect under voltage
colours according to label
1/2" NPT male conduit
Signal
Housing
green
white
yellow
+UB
Power Supply
0V
U ≤ 28 V
P ≤ 1 W
4..20mA
Measuring instrument
Shunt
+Signal
–Signal
Parameters
Hazardous area
Non–Hazardous area
Generally, any installation, operation, maintenance, or service in hazardous areas is allowed only by authorised personnel and must follow today's directives and regulations.
To amb max. see label (minimum is 60° C)
In accordance to Operating Instruction No. 669746
Warning:
Substitution of components may impair intrinsic safety.
HYDAC ELECTRONIC
66128 Sbr.–Gersweiler Hauptstr.27
HDA4xx –A–xxxx–(xxx)– xx–ggg
Control Drawing
Ex nA; Ex ta,tb,tc; IECEx
18–326–601–4–66 3284
Bl.2/2
A 20.10.09 Hi/Eitel 759907
B 14.11.12 Jo/Eitel 824486
2008 Datum Name
gez. 06.03. U.Hien
gepr.PV 20.10.09 A.Eitel
gepr.EWL 21.10.09 J.Morsch
66..._CONTROL DRAWING\663284–1.PCB (aus 3126)

Annex: Certificate

IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.: IECEx KEM 08.0014X Issue No.:2

Certificate history:
Issue No. 2 (2013-1-25)
Issue No. 1 (2009-7-8)
Issue No. 0 (2008-4-28)

Status: **Current**

Date of Issue: **2013-01-25** Page 1 of 4

Applicant: **Hydac Electronic GmbH**
Hauptstraße 27
66128 Saarbrücken
Germany

Electrical Apparatus: **Pressure Transducer Type HDA 4abc-A-d-(e)-lfg-h-i1 j k**
Optional accessory:

Type of Protection: **Ex ia, Ex ic, Ex nA, Ex ta, Ex tb, Ex tc**

Marking:
Ex ia I Ma
Ex ia IIC T6 Ga, Ex ia IIC T6 Ga/Gb, Ex ia IIC Gb
Ex ic IIC T6/T5/T4 Gc
Ex nA IIC T6/T5/T4 Gc
Ex ia IIIC T85 °C Da
Ex ic IIIC T80/90/100 °C Dc
Ex ta IIIC T80/90/100 °C T_{500}90/100/110 °C Da
Ex tb IIIC T80/90/100 °C Db
Ex tc IIIC T80/90/100 °C Dc

Approved for issue on behalf of the IECEx Certification Body: T. Pijpker

Position: Certification Manager

Signature:
(for printed version)

Date: 2013-01-25

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

DEKRA Certification B.V.
Utrechtseweg 310
6812 AR Arnhem
The Netherlands

DEKRA

IECEx Certificate of Conformity

Certificate No.: IECEx KEM 08.0014X

Date of Issue: **2013-01-25** Issue No.: **2**

Page 2 of 4

Manufacturer: **Hydac Electronic GmbH**
Hauptstraße 27
66128 Saarbrücken
Germany

Additional Manufacturing location (s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2011 Edition: 6.0	Explosive atmospheres - Part 0: General requirements
IEC 60079-11 : 2011 Edition: 6.0	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-15 : 2010 Edition: 4	Explosive atmospheres - Part 15: Equipment protection by type of protection "n"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 60079-31 : 2008 Edition: 1	Explosive atmospheres – Part 31: Equipment dust ignition protection by enclosure 't'

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
NL/KEM/ExTR08.0003/00 NL/KEM/ExTR08.0003/01 NL/KEM/ExTR08.0003/02

Quality Assessment Report:

DE/BVS/QAR06.0017/04

IECEx Certificate of Conformity

Certificate No.: IECEx KEM 08.0014X

Date of Issue: **2013-01-25** Issue No.: **2**

Page 3 of 4

Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

Refer to Annex 1 to Certificate of Conformity IECEx KEM 08.0014 X

CONDITIONS OF CERTIFICATION: YES as shown below:

1. Pressure transmitters with an enclosure containing light metals, when used in a potentially explosive atmosphere requiring apparatus of Equipment Protection Level Ga or Ma, shall be installed such, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.

2. For installation of the pressure transmitter between areas where the use of apparatus of Equipment Protection Level Ga or Da is required and areas where the use of apparatus of Equipment Protection Level Gb or Db is required, the following applies:
The internal separation element shall be protected against environmental stress, which might adversely affect the separation element. The material of the separation element shall be obtained from the data supplied by the manufacturer.

Note: These conditions do not apply to equipment of Equipment Protection Levels Gc and Dc

IECEx Certificate of Conformity

Certificate No.: IECEx KEM 08.0014X

Date of Issue: **2013-01-25** Issue No.: **2**

Page 4 of 4

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above):

- Assessment to latest editions of the standards;
- added models in types of protection Ex nA IIC and Ex ic IIC;
- added versions with new electrical and mechanical connections;
- added models in types of protection Ex ta, Ex tb and Ex tc.

Annexe: Annex 1 to CoC KEM 08.0014X-I02.pdf

DEKRA

Annex 1 to Certificate of Conformity IECEx KEM 08.0014X, issue 2

Description

Pressure Transducer Model HDA 4abc-A-d-(e)-lfg-h-i1 j k

where:

a = measurement accuracy (1, 3, 4, 7 or 8)
b = mechanical connection (process) (1, 2, 3, 4, 5, 6, 7, 8, 9, A, C, E, F, G, H, K, L, M ... Y, W, Z)
c = electrical connection 1, C,D,E = fixed cable, flying leads
2 ... 8, F, H, K, L, M, N, S, V = several types of connectors
9, G = 1/2" NPT conduit connection (male)
A = connector with 1/2" NPT female adapter
other letters free for future use
d = measuring range (5 digits, bar or PSI) up to 1000 bar max. (15000 psi max.)
e = mechanical connection (b = Z) alphanumerical code (3 digits)
f = isolation variants H = 500 Vac isolation from enclosure
N = 125 Vac isolation from enclosure (functional only)
g = approval variants 1 = Ex ia I Ma and
Ex ia IIC T6 Ga and
Ex ia IIC T6 Ga/Gb and
Ex ia IIC T6 Gb
2 = Ex ia I Ma and
Ex ia IIC T6 Gb
3 = Ex ia IIC T6 Gb
4 = Ex ia IIC T6 Ga and
Ex ia IIC T6 Gb
5 = Ex ia I Ma
9 = Ex nA IIC T6, T5, T4 Gc
A = Ex ta IIIC T80 °C T_{500} 90 °C or T90 °C T_{500} 100 °C or
T100 °C T_{500} 110 °C Da and
Ex tb IIIC T80 °C or T90 °C or T100 °C Db
B = Ex tc IIIC T80 °C or 90°C or T100°C Dc
C = Ex ic IIC T6, T5, T4 Gc and
Ex ic IIIC T80 °C or T90 °C or T100 °C Dc
D = Ex ia I Ma and
Ex ia IIC T6 Ga and
Ex ia IIC T6 Ga/Gb and
Ex ia IIC T6 Gb
Ex ia IIIC T85 °C Da
h = indication for modifications (3 digits); 000 for standard version
i = sealing material E = EPDM sealing *)
F = FPM sealing *)
1 = stainless steel *)
medium connection
j = (psi) for psi version (not applicable for bar version)
k = length of cable, if applicable, in cm or inch as indicated

*) only applicable for models with a = 1 or 3

DEKRA Certification B.V. Utrechtseweg 310, 6812 AR Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
T +31 26 3 56 20 00 F +31 26 3 52 58 00 www.dekra-certification.com Registered Arnhem 09085396

DEKRA

Annex 1 to Certificate of Conformity IECEx KEM 08.0014X, issue 2

Pressure Transducer Series HDA 4... is used for conversion of a pressure signal into a proportional electrical signal (4 - 20 mA current signal).
The electrical components of the transducer are completely encapsulated within a metal enclosure; the electrical connections are done by a connector or via a permanently connected cable.
All variations of electrical connections are allowed for the intrinsically safe versions.

The enclosure of the pressure transmitters type HDA 4...-A-.....-(...)-I.g-... (with g = 9, A, B or C) provides a degree of protection of at least IP64 in accordance with IEC 60529.

Thermal data

Ambient temperature range:
- apparatus in types of protection Ex ia I, Ex ia IIC and Ex ia IIIC: -40 °C to +60 °C;
- apparatus in types of protection Ex ic IIIC, Ex ta IIIC, Ex tb IIIC and Ex tc IIIC: -40 °C to +80 °C;
- apparatus in types of protection Ex nA IIC, and Ex ic IIC: -40 °C to +85 °C.

The temperature class and the maximum surface temperature T and T_{500} are depending on the maximum ambient temperature:

Maximum ambient temperature	Temperature class	Max surface temperature T	Max surface temperature T_{500}
60 °C	T6	80 °C	90 °C
70 °C	T5	90 °C	100 °C
80 °C		100 °C	110 °C
85 °C	T4		

Electrical data

Intrinsically safe versions:

Supply/output circuit (connections + and -):
in type of protection intrinsic safety Ex ia I, Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 28 V; I_i = 100 mA; P_i = 1 W; C_i = 22 nF; L_i = 0 mH.

From a safety point of view, the supply/output circuit of pressure transmitters type HDA 4...-A-...-(...)-IN.-...-.... shall be considered to be connected to earth.

Other versions:

Supply/output circuit (connections + and -):
U ≤ 28 V: P ≤ 1 W.

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IECEx Certificate of Conformity

INTERNATIONAL ELECTROTECHNICAL COMMISSION
IEC Certification Scheme for Explosive Atmospheres

for rules and details of the IECEx Scheme visit www.iecex.com

Certificate No.:	IECEx TSA 09.0041X issue No.:0	Certificate history:
Status:	**Current**	
Date of Issue:	**2010-01-20**	Page 1 of 3
Applicant:	**Hydac Pty Ltd** 109-111 Dohertys Road North Altona Victoria, 3025 **Australia**	
Electrical Apparatus: *Optional accessory:*	**Pressure Transducer Type HDA 4abc-A-d-lef-g-h1i j**	
Type of Protection:	**Ex ia I, Ex ia IIC, Ex iaD, Ex tD**	
Marking:	**HYDAC ELECTRONIC** **HDA 4abc-A-d-lef-g-h1ij** **Ex ia I or Ex ia IIC T6 or Ex ia IIC T6 Ga or** **Ex iaD 20 IP6X T85 C Da or Ex tD A21 IP6X T85 C Db** **IECEX TSA 09.0041X** **Serial No. XXXXXXXXX**	
Approved for issue on behalf of the IECEx Certification Body:	Ujen Singh	
Position:	Quality & Certification Manager	
Signature: *(for printed version)*		
Date:	20 JANUARY 2010.	

1. This certificate and schedule may only be reproduced in full.
2. This certificate is not transferable and remains the property of the issuing body.
3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website.

Certificate issued by:

TestSafe Australia
919 Londonderry Road
Londonderry NSW 2753
Australia

IECEx Certificate of Conformity

Certificate No.: IECEx TSA 09.0041X

Date of Issue: **2010-01-20** Issue No.: **0**

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Manufacturer: **Hydac Electronic GmbH**
Hauptstraße 27
66128 Saarbrucken
Germany

Manufacturing location(s):

This certificate is issued as verification that a sample(s), representative of production, was assessed and tested and found to comply with the IEC Standard list below and that the manufacturer's quality system, relating to the Ex products covered by this certificate, was assessed and found to comply with the IECEx Quality system requirements. This certificate is granted subject to the conditions as set out in IECEx Scheme Rules, IECEx 02 and Operational Documents as amended.

STANDARDS:
The electrical apparatus and any acceptable variations to it specified in the schedule of this certificate and the identified documents, was found to comply with the following standards:

IEC 60079-0 : 2004 Edition: 4.0	Electrical apparatus for explosive gas atmospheres - Part 0: General requirements
IEC 60079-11 : 2006 Edition: 5	Explosive atmospheres - Part 11: Equipment protection by intrinsic safety "i"
IEC 60079-26 : 2006 Edition: 2	Explosive atmospheres - Part 26: Equipment with equipment protection level (EPL) Ga
IEC 61241-0 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 0: General requirements
IEC 61241-1 : 2004 Edition: 1	Electrical apparatus for use in the presence of combustible dust - Part 1: Protection by enclosures "tD"
IEC 61241-11 : 2005 Edition: 1	Electrical apparatus for use in the pressence of combustible dusts - Part 11: Protection by intrinsic safety 'iD'

*This Certificate **does not** indicate compliance with electrical safety and performance requirements other than those expressly included in the Standards listed above.*

TEST & ASSESSMENT REPORTS:
A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:

NL/KEM/ExTR08.0003/00
NL/KEM/ExTR08.0003/01

Quality Assessment Report:
DE/BVS/QAR06.0017/02

IECEx Certificate of Conformity

Certificate No.: IECEx TSA 09.0041X

Date of Issue: **2010-01-20** Issue No.: **0**

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Schedule

EQUIPMENT:
Equipment and systems covered by this certificate are as follows:

Pressure Transducer Series HDA 4... is used for conversion of a pressure signal into a proportional electrical signal (4-20 mA current signal)
The electrical components of the transducer are completely encapsulated within a metal enclosure. The electrical connections are done by a connector or via a permanently connected cable.
All variations of electrical connections are allowed for the intrinsically safe versions.
Refer Annexe for details of models.

CONDITIONS OF CERTIFICATION: YES as shown below:

Refer Annexe for details of parameters.

HYDAC ELECTRONIC GMBH

Hauptstraße 27

D-66128 Saarbrücken

Germany

Web: www.hydac.com

E-Mail: electronic@hydac.com

Phone: +49-(0)6897-509-01

Fax: +49-(0)6897-509-1726

HYDAC Service

If you have any questions concerning repair work, please do not hesitate to contact HYDAC Service:

HYDAC SERVICE GMBH

Hauptstr. 27

D-66128 Saarbrücken

Germany

Phone: +49-(0)6897-509-1936

Fax: +49-(0)6897-509-1933

NOTE

The information and particulars provided in this manual apply to the operating conditions and applications described herein. For applications or operating conditions not described, please contact the relevant technicaldepartment.

If you have any questions, suggestions, or encounter any problems of a technical nature, please contact your Hydac representative.

Subject to technical modifications.