

Bedienungsanleitung (Original-Bedienungsanleitung) Druckmessumformer Serie HDA 4000 mit Explosion Proof / Flame Proof-Zulassung

Operating Instructions (Translation of the original operating instructions)
Pressure Transmitter Series HDA 4000
with Explosion Proof / Flame Proof approval



CSA Explosion Proof (seal not required)
ATEX Flame Proof
IECEx Flame Proof

Certificate No.: CSA MC 224264
Certificate No.: KEMA 10ATEX0100 X
Certificate No.: IECEX KEM 10.0053X

Certification El. Connection	1/2 -14 NPT Conduit or M20x1.5 Conduit Single leads	1/2 -14 NPT Conduit or M20x1.5 Conduit Jacketed cable
<i>cCSA_{US}</i>	Class I Groups A, B, C, D, T6, T5 Class I Zone 1 AEx db IIC T6, T5 Gb [US] Ex db IIC T6, T5 Gb [C] Class II Groups E, F, G T110°C, T120°C, T130°C Zone 21 AEx tb IIIC T110°C, T120°C, T130°C Db [US] Ex tb IIIC T110°C, T120°C, T130°C Db [C] Class III Type 4	Class I Groups A, B, C, D, T6, T5 Class I Zone 1 AEx db IIC T6, T5 Gb [US] Ex db IIC T6, T5 Gb [C] Class II Groups E, F, G T110°C Zone 21 AEx tb IIIC T110°C Db [US] Ex tb IIIC T110°C Db [C] Class III Type 4
<i>ATEX</i>	I M2 Ex db I Mb II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110°C, T120°C, T130°C Db	I M2 Ex db I Mb II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110°C Db
<i>IECEX</i>	Ex db I Mb Ex db IIC T6, T5 Gb Ex tb IIIC T110°C, T120°C, T130°C Db	Ex db I Mb Ex db IIC T6, T5 Gb Ex tb IIIC T110°C Db

Certification El. Connection	Connection head Aluminum	Connection head Stainless steel
<i>cCSA_{US}</i>	Class I Groups A, B, C, D, T6, T5 Class I Zone 1 AEx db IIC T6, T5 Gb [US] Ex db IIC T6, T5 Gb [C]	Class I Groups B, C, D, T6, T5
	Class II Groups E, F, G T110°C, T120°C, T130°C	Class II Groups E, F, G T110°C, T120°C, T130°C
	Class III	Class III
	Type 4	Type 4
<i>ATEX</i>	II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110°C, T120°C, T130°C Db	II 2G Ex db IIC T6, T5 Gb II 2D Ex tb IIIC T110°C, T120°C, T130°C Db
<i>IECEX</i>	Ex db IIC T6, T5 Gb Ex tb IIIC T110°C, T120°C, T130°C Db	Ex db IIC T6, T5 Gb Ex tb IIIC T110°C, T120°C, T130°C Db

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1. Allgemeine Bemerkungen

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 einzeln auf einem rechnergesteuerten Prüfplatz abgeglichen und einem Endtest unterzogen. Sie sind wartungsfrei und sollten beim Einsatz innerhalb der Spezifikationen (siehe Technische Daten) einwandfrei arbeiten. Sollten trotzdem Fehler auftreten wenden Sie sich bitte an den HYDAC-Service.

Nicht vorschriftgemäße Montage oder Fremdeingriffe in das Gerät führen zum Erlöschen jeglicher Gewährleistungsansprüche sowie der ATEX, IECEx und CSA Zulassung.

2. Funktionsweise

Das vom Sensor gemessene Drucksignal wird in ein proportionales analoges 4 .. 20 mA Signal umgewandelt..

3. Installation und Inbetriebnahme

Die Druckmessumformer können auf Prozess-Seite direkt über den Gewindeanschluss montiert werden. Es ist bei der Montage darauf zu achten, dass die Membran während der Montage nicht beschädigt wird. Dies ist speziell bei Geräten mit frontbündiger Membran wichtig.

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 Minimesse-Leitung zu entkoppeln. Anzugsdrehmoment siehe Abmessungen.

Die Druckmessumformer Modell "V" (belüftet zur Atmosphäre, siehe Typenschlüssel) bietet einen Druckausgleich mit dem Umgebungsdruck. Dies wird durch eine flammsichere Bohrung ermöglicht, welche sich am elektrischen Anschluss befindet.

Wenn die Druckmessumformer gemäß der Nordamerikanischen Zulassungen eingesetzt werden, ist die Benutzung eines Conduit Systems am 1/2-14 NPT oder M20x1,5 Gewinde des elektrischen Anschlusses zwingende Voraussetzung, auch im Zonen-System.

Die Installation muss von einem Fachmann nach den jeweiligen Landesvorschriften zu potenziell explosiven Umgebungen durchgeführt werden, z.B.: IEC / EN 60079-14.

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

Die Forderungen der Normen (siehe technische Daten) werden nur bei ordnungsgemäßer und fachmännischer Erdung des Druckmessumformer-Gehäuses mittels des Prozessanschlusses, dem 1/2-14 NPT oder M20x1,5 Conduit oder der Erdungsklemme (außen an einem Anschlusskopfs), erreicht. Sofern eine grün/gelbe Ader vorhanden ist, darf diese zusätzlich, aber nicht zur alleinigen Erdung verwendet werden. Wenn der Hydraulikanschluss über einen Schlauch erfolgt, ist das Gehäuse separat zu erden.

Die Geräte müssen während der Installation geerdet sein.

Die Eignung der Erdung unterliegt der Abnahme der lokal zuständigen Prüfbehörden.

Allgemeine Sicherheitshinweise (vgl. Abschnitt 5) sind in jedem Fall zu beachten.

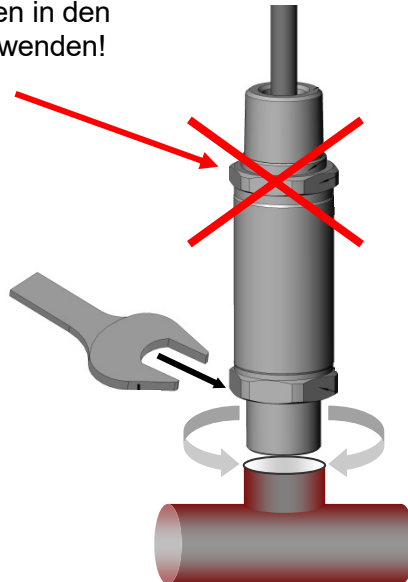
Einbau gemäß Kontrollzeichnungen Nr. 663931 (siehe Anhang A1)

4. Wichtige Hinweise für die Conduit-Installation

Mechanische Installation

Für die Montage des Prozessanschlusses darf nur die Schlüssel­fläche an der Prozessanschlus­seite des Gerätes verwendet werden.

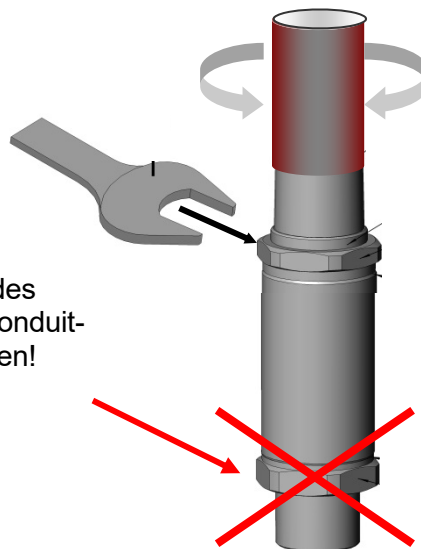
Nicht zum Einschrauben in den Prozessanschluss verwenden!



Elektrische Installation

Die Schlüssel­fläche an der Seite des elektrischen Anschlusses dient nur zum Fixieren des Gerätes während der Conduit-Installation.

Nicht zum Fixieren des Sensors während der Conduit-Installation verwenden!





5. Allgemeine Sicherheitshinweise

Wenn das Etikett nicht mehr lesbar ist, muss der Druckmessumformer außer Betrieb genommen werden.

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.

Wenn das Gerät oder Anschlusskabel beschädigt ist, müssen diese Bauteile ersetzt werden.

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"). Ebenso sind die im Zertifikat angegebenen "Sicherheitstechnischen Daten" einzuhalten.

Die interne Messmembran des Druckmessumformers ist gegen mechanische Beschädigung zu schützen. Dies gilt insbesondere bei Geräten mit einer frontbündigen Membran.

Das Trennmittel zwischen der frontbündigen Membran und der internen Membran ist Paraffinöl (Weißöl, S933).

Der Druckmessumformer ist so zu installieren und zu verwenden, dass elektrostatische Aufladungen durch Betrieb, Wartung und Reinigung ausgeschlossen werden. Für den Einsatz in staubexplosionsgefährdeten Bereichen müssen prozessbedingte elektrostatische Aufladungen, z.B. durch vorbeiströmende Medien, ausgeschlossen werden.“

Die Geräte müssen während der Installation geerdet sein. Die Eignung der Erdung unterliegt der Abnahme der lokal zuständigen Prüfbehörden.

Versorgungsspannung: "Limited Energy" - gemäß CAN/UL 61010 (Clause 9.4), Class 2 UL1310, LPS (CAN/UL 60950).

Hinweis zur Verwendung des elektrischen Anschlusses allgemein (außer Anschlusskopf Aluminium mit Typenschlüssel-Code J):

- Für Class I, II und III: Seal not required.

Hinweis zur Verwendung für elektrische Anschlüsse mit integriertem Kabel mit Typenschlüssel-Code 9, G, U und W:

- Die Installation muss von einem Fachmann nach den jeweiligen Landesvorschriften zu potenziell explosiven Umgebungen durchgeführt werden (z.B.: IEC / EN 60079-14).
- Fester Einbau ist notwendig.

Hinweis zur Verwendung des elektrischen Anschlusses bei Einsatz z. B. eines Anschlusskopfes oder eines Klemmenkastens.

Generell ist immer die "Schedule of Limitations" (Liste der Einschränkungen) beim Anschluss der Druckmessumformer an einen Klemmkasten oder einen Anschlusskopf zu berücksichtigen.

Die Zertifikate für die Geräte mit Anschlusskopf, welcher von HYDAC Electronic montiert wird (im Typenschlüssel Code J und Q), werden als Beilagedokument mitgeliefert.

Auszug aus den Zertifikaten der Hersteller Limatherm und Pushna als Beispiele für "Schedule of Limitations" (Liste der Einschränkungen).

- Aluminium Anschlusskopf (Code J im Typenschlüssel), Hersteller Limatherm, Serie XD-AD:
 - Auszug aus dem CSA Zertifikat:
"For Class I Group A and for Class I Zone 1 installation a conduit seal is required within 18 inches of enclosure"
("Für Class I Group A und für Class I Zone 1 Einbau ist ein Conduit Seal (Zündsperre) innerhalb eines Abstands von 18" vom Gehäuse gemessen anzubringen")
 - Auszug aus dem ATEX / IECEx Zertifikat:
"No. 2 from Schedule of limitations: For Information on the dimensions of the flameproof joints the manufacturer shall be contacted"
("Nr. 2 aus der Schedule of Limitations: Für Informationen über die Abmessungen der explosionssicheren Verbindungen ist der Hersteller zu kontaktieren.")
- Edelstahl Anschlusskopf (Code Q im Typenschlüssel), Hersteller Pushna, Serie 1016 PSEM
 - Auszug aus dem CSA Zertifikat:
"Open circuit before removing cover"
"Den Deckel nur im ausgeschalteten Zustand (unterbrochener Stromkreis) entfernen."
 - Auszug aus dem ATEX / IECEx Zertifikat:
"No. 8 from Schedule of limitations: Consult the manufacturer if dimensional information on the flameproof joints is necessary"
("Nr. 8 aus der Schedule of Limitations: Bitte konsultieren Sie den Hersteller, sofern Informationen über die Abmessungen der explosionssicheren Verbindungen benötigt werden.")



Wichtiger Hinweis für den Einsatz in Bergwerksanwendungen:

Die chemische Beständigkeit der Druckmessumformer mit elektrischem Anschluss mittels Conduit mit Einzeladern oder freiem Kabelende ist nicht für den Einsatz in Bergwerksapplikationen gemäß ATEX und IECEx Gerätegruppe I getestet.

Für den Einsatz in Bergwerksapplikationen muss ein Conduit-Schlauch oder -Rohr am elektrischen ½-14 NPT oder M20x1,5 Anschluss installiert werden und das Kabel oder die Adern müssen so weit durch den Conduit bzw. das Rohr geführt werden bis ein Bereich erreicht wird, der außerhalb der chemischen Kontaminierung liegt.

6. Technische Daten

Eingangsgrößen		HDA 4400					HDA 4700						
Messbereiche	bar	-1..3	-1..9	2,5	4	6	10	16	20	25	40	60	
		100	160	250	275	300	400	500	600	1000	1600	2000	
Überlastbereiche	bar	8	20	8	8	12	20	32	50	50	80	120	
		200	320	500	800	800	800	1000	1000	1600	2400	3000	
Berstdruck	bar	100	100	100	100	100	100	100	125	125	200	300	
		500	800	1250	2000	2000	2000	3000	3000	3000	3000	4000	
Messbereiche	psi	-14,5.. +135,5	100	150	200	300	500	600	1000	1500	2000	2500	
	psi	3000	4000	5000	6000	7500	9000	10000	15000	20000	30000		
Überlastbereiche	psi	290	290	290	464	725	1160	1160	2900	2900	4640	7250	
	psi	7250	11600	11600	11600	14500	14500	14500	23200	34800	43500		
Berstdruck	psi	1450	1450	1450	1450	1813	2900	2900	7250	7250	11600	18125	
	psi	18125	29000	29000	29000	29000	29000	29000	43500	43500	58000		
Mechanischer Anschluss	siehe Typenschlüssel / Abmessungen												
Anzugsdrehmoment, empfohlen	Empfohlenes Anzugsdrehmoment siehe Abmessungen												
Medienberührende Teile		Standard							Frontbündig				
	Edelstahl	1.4542 (630);1.4571 (316Ti);1.4435 (316LMHO); 1.4404 (316L); 1.4301 (304); 1.4548 (630)							1.4435 (316LMHO); 1.4301 (304)				
	Dichtung	Ohne: ¼ NPT (male, female), Autoclave Kupfer (Cu-DHP): G 1/2 B FKM: Alle anderen Prozessanschlüsse							FKM				
									Druckmittlerflüssigkeit: Silikon freies Öl				
Conduit- / Gehäusewerkstoff	1.4404(316L); 1.4435 (316LMHO)												
Ausgangsgrößen													
Ausgangssignal, zulässige Bürde		4 .. 20 mA, 2-conductor; R _{Lmax} = (U _B – 8 V) / 20 mA [kΩ] 0,5 .. 4,5 V; 1 .. 5 V; 0 .. 10 V, 3-conductor; R _{Lmin} = 50 [kΩ]											
Genauigkeit nach DIN16086	Typ.	± 0,5 % FS							± 0,25 % FS				
Grenzpunkteinstellung	Max.	± 1 % FS							± 0,5 % FS				
Genauigkeit bei Kleinstwert- einstellung (B.F.S.L.)	Typ.	± 0,25 % FS							± 0,15 % FS				
	Max.	± 0,5 % FS							± 0,25 % FS				
Temperaturkompensation	Typ.	± 0,015 % FS / °C [± 0,0085 % FS / °F]							± 0,008 % FS / °C [± 0,0045 % FS / °F]				
Nullpunkt	Max.	± 0,025 % FS / °C [± 0,014 % FS / °F]							± 0,015 % FS / °C [± 0,0085 % FS / °F]				
Temperaturkompensation	Typ.	± 0,015 % FS / °C [± 0,0085 % FS / °F]							± 0,008 % FS / °C [± 0,0045 % FS / °F]				
Spanne	Max.	± 0,025 % FS / °C [± 0,014 % FS / °F]							± 0,015 % FS / °C [± 0,0085 % FS / °F]				
Nicht-Linearität bei Grenzpunkt- einstellung 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		-25 .. +85 °C [-13 .. +185 °F]											
Betriebs-/ Umgebungs- / Mediums- temperaturbereich ^{1) 2)}		T5, T130 °C: -20 .. +80 °C [-4 .. +176 °F] T120 °C: -20 .. +70 °C [-4 .. +158 °F] T6, T110 °C: -20 .. +60 °C [-4 .. +140 °F]							T5, T130 °C: -40 .. +80 °C / -20 ... +80 °C [-40 ..+176 °F / -4 .. +176 °F] T120 °C: -40 .. +70 °C / -20 .. +70 °C [-40 .. +158 °F / -4 .. +158 °F] T6, T110 °C: -40 .. +60 °C / -20 ... +60 °C [-40 ..+140 °F / -4 .. +140 °F]				
Lagertemperaturbereich		-40 .. +100 °C [-40 .. +212 °F]											
CE - Zeichen, UK -Zeichen		EN 61000-6-1 /2 /3 /4; EN 60079-0 /1 /31											
Vibrationsbeständigkeit nach DIN EN 60068-2-6 bei 10 ..500 Hz		≤ 10 g ≤ 5 g mit Anschlusskopf											
Schutzart nach IEC 60529 ³⁾		IP 65 (Vented Gauge), IP 68 (Versionen mit Anschlusskopf, Sealed Gauge), IP 69 (Sealed Gauge) IP 6K9K (Sealed Gauge)											
ISO 20653													

Sonstige Größen	
Versorgungsspannung ⁴⁾	8 .. 30 V DC, 2-Leiter 4 .. 20 mA 8 .. 30 V DC, 3-Leiter 0,5 .. 4,5 V, 1 .. 5 V 12 .. 30 V DC, 3-Leiter 0 .. 10 V
Restwelligkeit Versorgungsspannung	≤ 5 %
Stromaufnahme	≤ 25 mA
Lebensdauer ⁵⁾	>10 Mio. Lastwechsel, 0 .. 100 % FS
Gewicht (ohne Anschlusskopf)	ca. 300g

Anm.: Verpolungsschutz der Versorgungsspannung, Überspannung-, Übersteuerungsschutz, Lastkurzschlussfestigkeit vorhanden.

FS (Full Scale) = bezogen auf den vollen Messbereich

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

¹⁾ -40 °C gültig für Prozessanschlüsse G1/2 B DIN EN 837, 1/4 NPT (innen, außen) und Autoclave, -20 °C gültig für Prozessanschlüsse mit FKM Dichtung (Dichtung für -40 °C auf Anfrage)

²⁾ T120 °C, T130 °C nur mit der elektrischem Anschluss siehe S.1

³⁾ Für Anschlusskopf: Die Kabelverschraubung muss ebenfalls IP 68 erfüllen und das 1/2-14 NPT Gewinde der Kabelverschraubung muss mittels Gewindedichtungsmasse abgedichtet werden

⁴⁾ "Limited Energy" - gemäß CAN/UL 61010 (Clause 9.4), Class 2 UL1310, LPS (CAN/UL 60950).

⁵⁾ Messbereiche ≥ 1000 bar: > 1Million Lastwechsel (0 ..100 % FS)

7. Typenschlüssel zur Identifikation des gelieferten Gerätes

7.1 Typenschlüssel Standard

HDA 4 X X X - X - XXXX - D X - XXX (psi) (XX)

Genauigkeit

4 = 1 % FS max.

7 = 0,5 % FS max.

Anschlussart, mechanisch

1 = G1/2 B DIN EN 837, Außengewinde

2 = G 1/2 A ISO 1179-2, Außengewinde

4 = G 1/4 A ISO 1179-2, Außengewinde

5 = 7/16-20 UNF 2B (SAE4), Innengewinde

6 = 7/16-20 UNF 2A (SAE4), Außengewinde

7 = 9/16-18 UNF 2A (SAE6), Außengewinde

8 = 1/4-18 NPT, Außengewinde

B = F250 C, Autoclave (9/16-18 UNF 2B) Innengewinde

C = SF250CX20, Autoclave (7/16-20 UNF 2B) Innengewinde

F = 1/4-18 NPT, Innengewinde

W = 1/2-14 NPT, Außengewinde

Anschlussart, elektrisch

9 = 1/2-14 NPT Conduit (Außengewinde), Einzeladern

G = 1/2-14 NPT Conduit (Außengewinde), freies Kabelende

J = Anschlusskopf (Aluminium)

Q = Anschlusskopf (Edelstahl)

U = M20x1,5 Conduit (Außengewinde), freies Kabelende

W = M20x1,5 Conduit (Außengewinde), Einzelladern

Ausgangssignal

A = 4...20 mA (2-Leiter)

B = 0...10 V (3-Leiter)

G = 1...5 V (3-Leiter)

0,5...4,5 V (3-Leiter) in Kombination mit Modifikation 004

Messbereiche

Die Messbereiche werden in bar oder psi dargestellt

(bei psi, siehe zusätzliche Kennzeichnung)

- 5 Stellen, wenn größer als 9999 psi -

Zulassung

D = CSA Explosion Proof - Seal not required

ATEX - Flame Proof

IECEX - Flame Proof

Ausführung Messzelle

S = Sealed Gauge (abgedichtet zur Atmosphäre) ≥ 40 bar [≥ 500 psi]

V = Vented Gauge (belüftet zur Atmosphäre) < 40 bar [< 500 psi]

Modifikationsnummer

000 = Standard

004 = Ausgangssignal 0,5 .. 4,5 V in Verbindung mit Ausgangssignal „G“

Bei Geräten mit anderer Modifikationsnummer ist das Typenschild bzw. die mitgelieferte technische Änderungsbeschreibung zu beachten.

(psi)

Zusätzliche Kennzeichnung für psi-Versionen (entfällt bei bar-Version)

Kabellänge

Angabe in m oder inch

7.2 Typenschlüssel frontbündige Version

HDA 4 X Z X - X - XXXX - XXX -D X - XXX (psi) (XX)

Genauigkeit

4 = 1 % FS

7 = 0,5 % FS

Prozessanschluss

Z = Frontbündig

Anschlussart, elektrisch

9 = 1/2-14 NPT Conduit (Außengewinde), Einzeladern

G = 1/2-14 NPT Conduit (Außengewinde), freies Kabelende

J = Anschlusskopf (Aluminium)

Q = Anschlusskopf (Edelstahl)

U = M20x1,5 Conduit (Außengewinde), freies Kabelende

W = M20x1,5 Conduit (Außengewinde), Einzelladern

Ausgangssignal

A = 4...20 mA (2-Leiter)

B = 0...10 V (3- Leiter)

G = 1...5 V (3- Leiter)

0,5...4,5 V (3- Leiter) in Kombination mit Modifikation 004

Messbereiche

Die Messbereiche werden in bar oder psi dargestellt

(bei psi, siehe zusätzliche Kennzeichnung)

- 5 Stellen, wenn größer als 9999 psi -

Anschlussart, mechanisch

G01 = G1/2 A, ISO 1179-2 (DIN 3852)

G02 = G1/2 mit zusätzlicher frontseitiger O-Ring- Dichtung

Zulassung

D = CSA Explosion Proof - Seal not required

ATEX - Flame Proof

IECEx - Flame Proof

Ausführung Messzelle

S = Sealed Gauge (abgedichtet zur Atmosphäre) ≥ 40 bar [≥ 500 psi]

V = Vented Gauge (belüftet zur Atmosphäre) < 40 bar [< 500 psi]

Modifikationsnummer

000 = Standard

004 = Ausgangssignal 0,5 .. 4,5 V in Verbindung mit Ausgangssignal „G“

Bei Geräten mit anderer Modifikationsnummer ist das Typenschild bzw. die mitgelieferte technische Änderungsbeschreibung zu beachten.

(psi)

Zusätzliche Kennzeichnung für psi-Versionen (entfällt bei bar-Version)

Kabellänge

Angabe in m oder inch

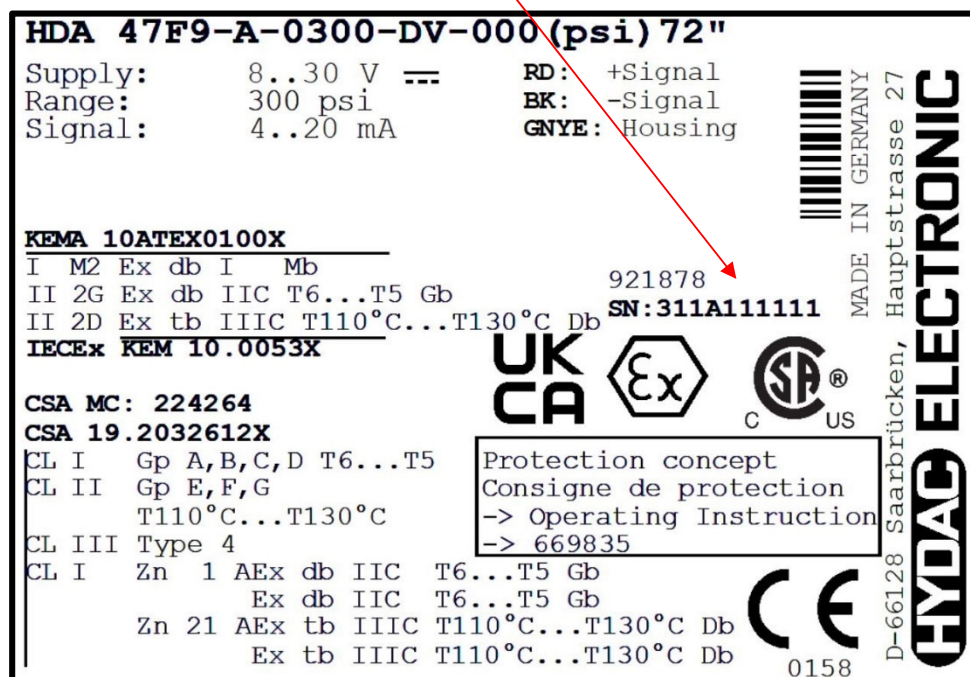
8. Seriennummer

Die Seriennummer enthält die Kalenderwoche und das Jahr, in dem das Gerät hergestellt wurde, neben der sequentiellen Seriennummer.

Konfiguration der Seriennummer (SN):

xyykzzzzzz

X	Herstellungsdatum	z.B. : 3 → 2023
yy	Kalenderwoche	z.B. : 11 → KW 11
k	Seriennummer-Index	z.B. : -, A, B
zzzzzz	Fortlaufende Seriennummer	z.B. : 111111



9. Anschlussbelegung

Conduit mit Einzeladern oder
Anschlusskopf (Klemmenblock)

Ader	
rot	Signal +
schwarz	Signal -
grün-gelb	Gehäuse

Ader	
rot	+U _B
weiß	Signal
schwarz	0 V
grün-gelb	Gehäuse

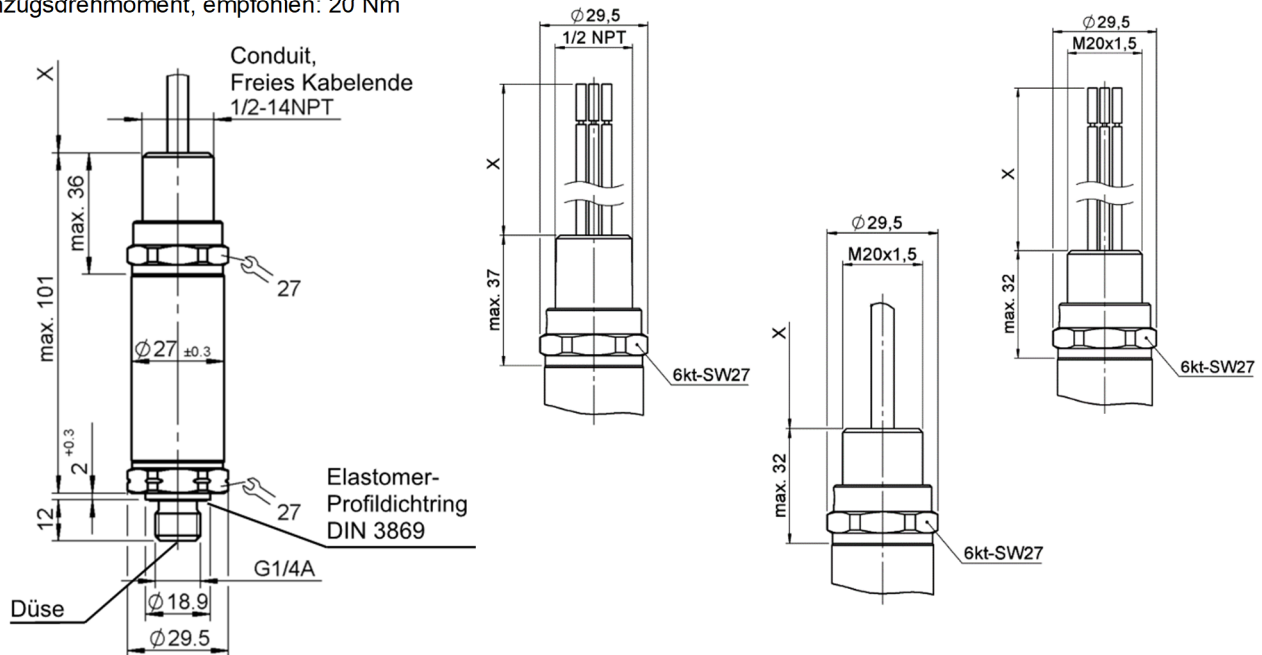
Conduit (freies Kabelende)

Ader	
braun	Signal +
weiß	Signal -
grün	n.c.
gelb	n.c.

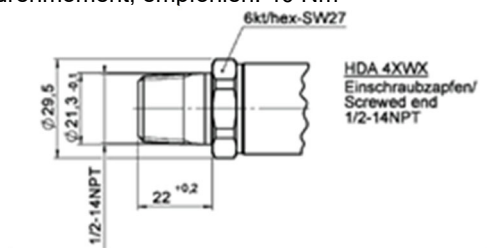
Ader	
braun	+U _B
grün	Signal
weiß	0 V
gelb	n.c.

10. Geräteabmessungen

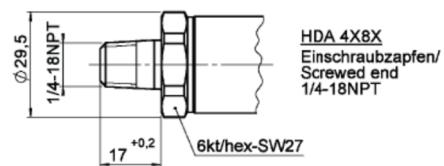
G 1/4 A ISO 1179-2, Außengewinde
Anzugsdrehmoment, empfohlen: 20 Nm



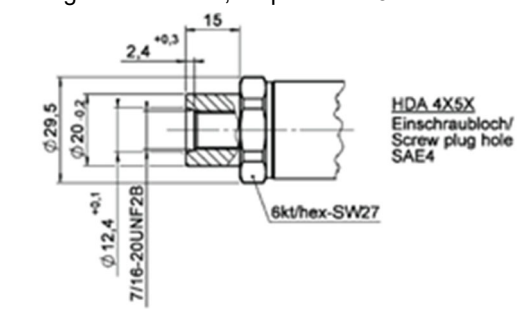
1/2 -14 NPT, Außengewinde
Anzugsdrehmoment, empfohlen: 40 Nm



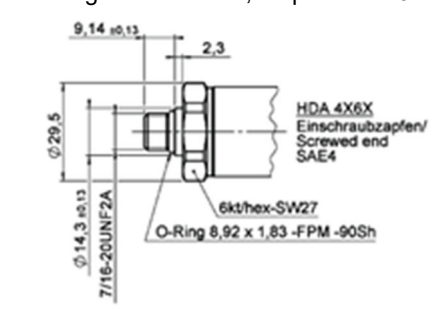
1/4 - 18 NPT, Außengewinde
Anzugsdrehmoment, empfohlen: 40 Nm



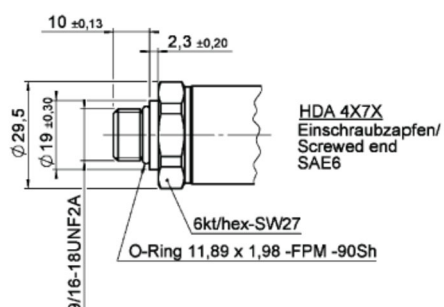
7/16-20 UNF 2B (SAE 4), Innengewinde
Anzugsdrehmoment, empfohlen: 15 Nm



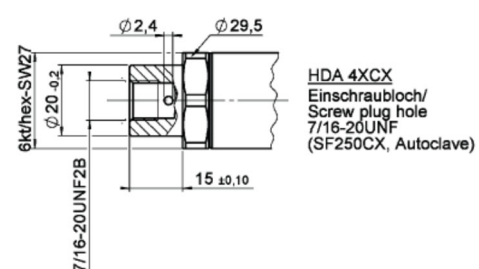
7/16-20 UNF 2A (SAE 4) Außengewinde
Anzugsdrehmoment, empfohlen: 15 Nm



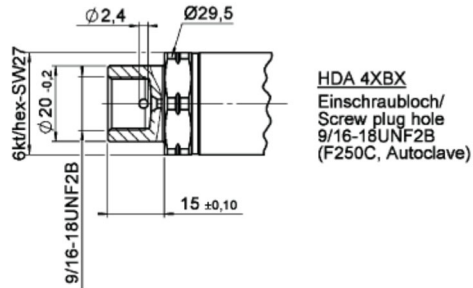
9/16-18 UNF 2A (SAE 6), Außengewinde
Anzugsdrehmoment, empfohlen: 20 Nm



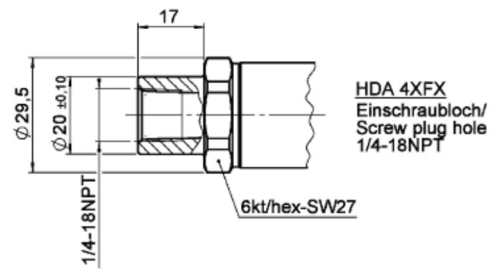
SF 250CX20, Autoclave (7/16-20 UNF 2B), Innengewinde
Anzugsdrehmoment, empfohlen:
15Nm (bis 600 bar/10000 psi)
30Nm (>600 bar / >10000 psi)



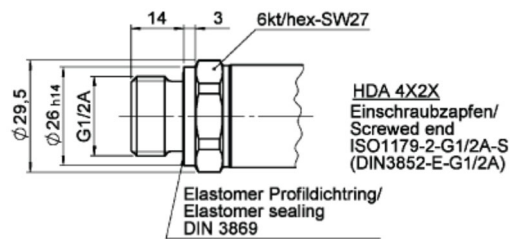
F250 C Autoclave (9/16-18 UNF 2B), Innengewinde
Anzugsdrehmoment, empfohlen: 20 Nm



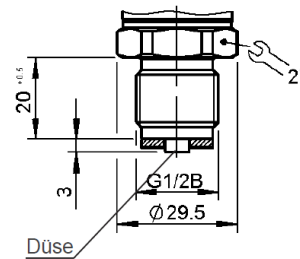
1/4-18 NPT, Innengewinde
Anzugsdrehmoment, empfohlen: 40 Nm



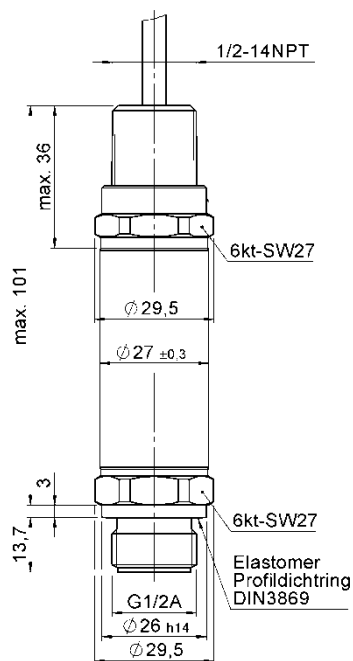
G1/2 A ISO 1179-2, Außengewinde
Anzugsdrehmoment, empfohlen: 45 Nm



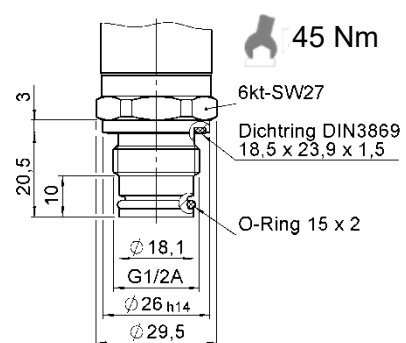
G1/2 B DIN EN 837, Außengewinde
Anzugsdrehmoment, empfohlen: 45 Nm



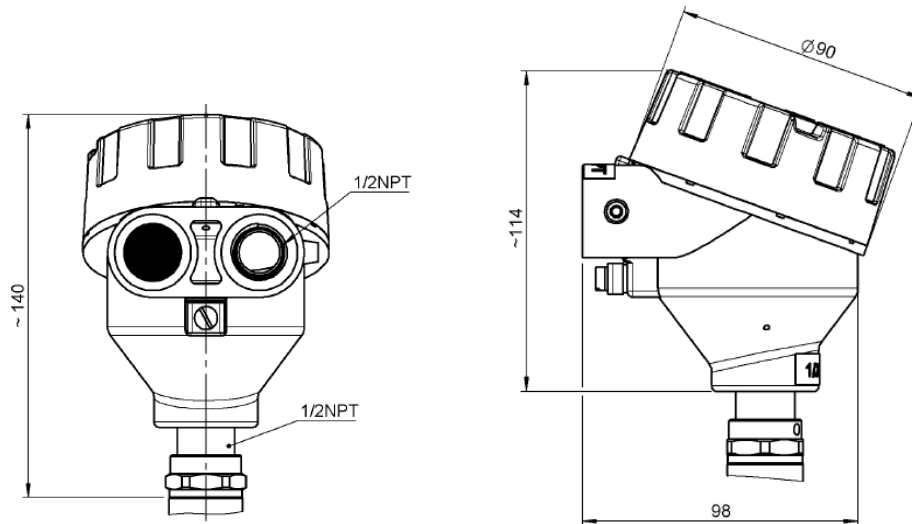
Mit frontbündiger Membran:



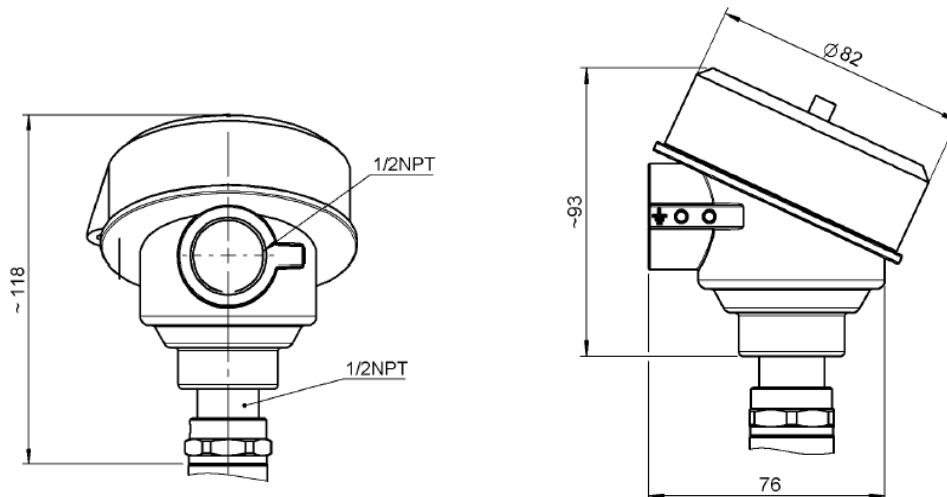
G1/2 mit zusätzlicher frontseitiger O-Ring-Dichtung



Anschlusskopf Aluminium:



Anschlusskopf Edelstahl:



Notizen

This image shows a full page of blank graph paper. The grid consists of small, equal-sized squares formed by thin black lines. There are no margins, text, or other markings on the page.

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HYDAC SERVICE

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

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Achtung!

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.

1. General Remarks

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.

Incorrect use or interference by anyone other than HYDAC personnel will cause all warranty claims and ATEX, IECEx und CSA approvals to become null and void.

2. Functionality

The pressure signal measured by the sensor is converted into a proportional analog 4..20 mA signal.

3. Installation and commissioning

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 Minimesse hose. Torque value see dimensions. The pressure transmitter type model "V" (vented gauge, see model code) provides pressure equalisation with the ambient pressure. This is ensured by a flame proof path. This flame proof path is located at the electrical connection conduit.

When the transmitters are used according to North American approvals, the use of a conduit system at the ½-14 NPT or M20x1,5 thread at the electrical connection is mandatory, also in the zone system.

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

The pressure transmitters of the HDA 4000 series carry the **CE** - and **UK CA** -mark. The certificate of conformity is to 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, the ½-14 NPT or M20x1.5 conduit or the ground terminal which is located at the outside of the connection head. 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 devices must be grounded during installation.

The suitability of the grounding shall be subject to the acceptance of the local inspection authority having jurisdiction.

The General Safety Precautions (cf. section 5) are to be heeded in any event.

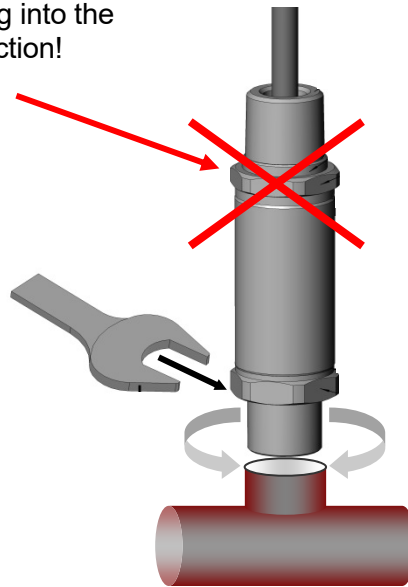
Installation per Control Drawings No. 663931 (see appendix A1)

4. Important Mounting Instructions for Conduit Connection

Mechanical Installation

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

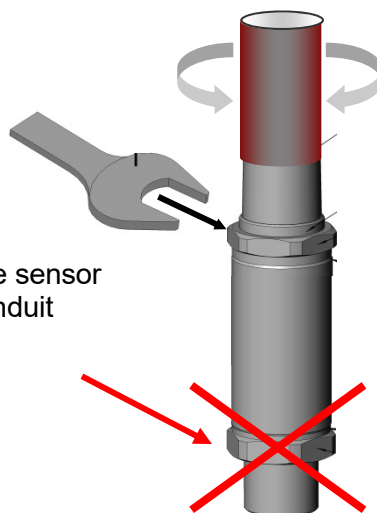
Do not use for screwing into the mechanical connection!



Electrical Installation

The electrical installation of the transmitter may only be carried out utilizing the flats on the electrical connection side.

Do not use for fixing the sensor during electrical conduit installation!





5. General safety precautions

The pressure transmitter may no longer be used when the label becomes illegible.

The seals must be checked to see that they function properly 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 seals, see technical data) This check is to be carried out at least every three years.

If there is damage to the unit or connecting lead, these components are to be replaced.

It is imperative that the measurement fluid is compatible with the materials used in the pressure transmitter, similarly, the overload pressures and burst pressures must be adhered to without fail (for these specifications, see the "Technical data"). The "Safety relevant Information" in the certificates must also be met. The data pertaining to use in hazardous location is to be heeded in any event.

The internal measurement membrane of the pressure transmitter is to be protected against mechanical damage. This applies especially for transmitters with flush membrane.

The transfer media between the flush membrane and the internal measurement membrane is paraffin oil (white oil, S933).

The pressure transmitter has to be installed and operated in a way that electrostatic charges, caused by operation, maintenance and cleaning, can be excluded. For the application in potentially dust-explosive areas, process-related electrostatic charge, i.e. due to fluids flowing past, has to be excluded.

The devices must be grounded during installation. The suitability of the grounding shall be subject to the acceptance of the local inspection authority having jurisdiction. Limited energy powered according to CAN/UL 61010 (Clause 9.4), Class 2 UL1310, LPS (CAN/UL 60950).

Note for use for electrical connection in general (except connection head aluminum, model code character J):

- For Class I, II and III: Seal not required.

Note for use for electrical connection" integrated cable" with model code character 9, G, U and W:

- The installation is to be carried out by a properly qualified specialist in accordance with the pertinent regulations pertaining to potentially explosive environments (e.g. IEC / EN 60079-14).
- A fixed installation is required.

Note for use for electrical connection by using e.g. a connection head or junction box.

In general, when transmitters are connected to a junction box or connection head always respect the schedule of limitations.

The certificates for devices with connection head assembled from HYDAC Electronic (model code character J and Q) are supplied as an appendix.

Excerpt of the certificates from the manufacturers Limatherm and Pushna as example for schedule of limitations:

- Aluminum connection head (model code character J), manufacturer Limatherm, series XD-AD:
 - Excerpt CSA certificate:
"For Class I Group A and for Class I Zone 1 installation a conduit seal is required within 18 inches of enclosure"
 - Excerpt ATEX / IECEx certificate:
"No. 2 from Schedule of limitations: For Information on the dimensions of the flameproof joints the manufacturer shall be contacted"

- Stainless steel connection head (model code character Q), manufacturer Pushna, series 1016 PSEM
 - Excerpt CSA certificate:
“Open circuit before removing cover”
 - Excerpt ATEX / IECEx certificate:
“No. 8 from Schedule of limitations: Consult the manufacturer if dimensional information on the flameproof joints is necessary”



Important note for the use in mining applications:

The chemical resistance for transmitters with electrical conduit connection with single leads or jacketed cable is not tested for the use in mining applications according to ATEX and IECEx equipment group I.

When used in mining applications a conduit hose or pipe is to be installed at the ½-14 NPT or M20x1.5 electrical connection and the cable or leads are to run inside the conduit until an area is reached which is not contaminated with chemicals.

6. Technical data

Input data		HDA 4400						HDA 4700				
Measuring ranges	bar	-1..3	-1..9	2,5	4	6	10	16	20	25	40	60
		100	160	250	275	300	400	500	600	1000	1600	2000
Overload ranges	bar	8	20	8	8	12	20	32	50	50	80	120
		200	320	500	800	800	800	1000	1000	1600	2400	3000
Burst pressures	bar	100	100	100	100	100	100	100	125	125	200	300
		500	800	1250	2000	2000	2000	3000	3000	3000	3000	4000
Measuring ranges	psi	-14.5..+135.5	100	150	200	300	500	600	1000	1500	2000	2500
	psi	3000	4000	5000	6000	7500	9000	10000	15000	20000	30000	
Overload ranges	psi	290	290	290	464	725	1160	1160	2900	2900	4640	7250
	psi	7250	11600	11600	11600	14500	14500	14500	23200	34800	43500	
Burst pressures	psi	1450	1450	1450	1450	1813	2900	2900	7250	7250	11600	18125
	psi	18125	29000	29000	29000	29000	29000	29000	43500	43500	58000	
Mechanical Connection	see model code / dimensions											
Tigthening torque, recommended	see dimensions											
Parts in contact with fluid		Standard							Flush membrane			
	Stainless steel	1.4542 (630);1.4571 (316Ti);1.4435 (316LMHO); 1.4404 (316L); 1.4301 (304); 1.4548 (630)							1.4435 (316LMHO); 1.4301 (304)			
	Seals	Not applicable: ¼ NPT (male, female), Autoclave Copper (Cu-DHP): G 1/2 B FKM: other process connections							FKM			
									Pressure transfer fluid: Silicon-free oil			
Conduit- / Housing material	1.4404(316L); 1.4435 (316LMHO)											
Output data												
Output signal, permitted load resistance		4 .. 20 mA, 2-conductor; R _{Lmax} = (U _B – 8 V) / 20 mA [kΩ] 0.5 .. 4.5 V; 1 .. 5 V; 0 .. 10 V, 3-conductor; R _{Lmin} = 50 [kΩ]										
Accuracy acc. to DIN 16086, terminal based	Typ. Max.	≤ ± 0.5 % FS ≤ ± 1 % FS						≤ ± 0.25 % FS ≤ ± 0.5 % FS				
Accuracy B.F.S.L	Typ. Max.	≤ ± 0.25 % FS ≤ ± 0.5 % FS						≤ ± 0.15 % FS ≤ ± 0.25 % FS				
Temperature compensation	Typ. Max.	≤ ± 0.015 % FS / °C [≤± 0.0085 % FS / °F]						≤ ± 0.008 % FS / °C [≤± 0.0045 % FS / °F]				
Zero point	Typ. Max.	≤ ± 0.025 % FS / °C [≤ ± 0.014 % FS / °F]						≤ ± 0.015 % FS / °C [≤± 0.0085 % FS / °F]				
Temperature compensation	Typ. Max.	≤ ± 0.015 % FS / °C [≤± 0.0085 % FS / °F]						≤ ± 0.008 % FS / °C [≤± 0.0045 % FS / °F]				
Span	Typ. Max.	≤ ± 0.025 % FS / °C [≤ ± 0.014 % FS / °F]						≤ ± 0.015 % FS / °C [≤± 0.0085 % FS / °F]				
Non-linearity acc. to DIN 16086, terminal based	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 stability	Typ.	≤ ± 0.3 % FS / year						≤ ± 0.1 % FS / year				
Environment conditions												
Compensated temperature range		-25 .. +85 °C [-4 .. +185 °F]										
Operating/ Ambient / Fluid temperature range ^{1) 2)}		T5, T130 °C: -20 .. +80 °C [-4 .. +176 °F] T120 °C: -20 .. +70 °C [-4 .. +158 °F] T6, T110 °C: -20 .. +60 °C [-4 .. +140 °F]						T5, T130 °C: -40 .. +80 °C / -20 ... +80 °C [-40 ..+176 °F / -4 .. +176 °F] T120 °C: -40 .. +70 °C / -20 .. +70 °C [-40 .. +158 °F / -4 .. +158 °F] T6, T110 °C: -40 .. +60 °C / -20 ... +60 °C [-40 ..+140 °F / -4 .. +140 °F]				
Storage temperature range		-40 .. +100 °C [-40 .. +212 °F]										
CE - mark, UK - 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		≤ 10 g ≤ 5 g with connection head										
Protection class to IEC 60529 ³⁾		IP 65 (Vented Gauge), IP 68 (versions with connection head, sealed gauge), IP 69 (Sealed Gauge)										
ISO 20653		IP 6K9K (Sealed Gauge)										

Other data		
Supply voltage ⁴⁾		8 .. 30 V DC, 2-conductor 4 .. 20 mA 8 .. 30 V DC, 3-conductor 0.5 .. 4.5 V, 1 .. 5 V 12 .. 30 V DC, 3-conductor 0 .. 10 V
Residual ripple supply voltage		≤ 5 %
Current consumption		≤ 25 mA
Life expectancy ⁵⁾		> 10 million cycles (0 .. 100 % FS)
Weight (without connection head)		approx. 300 g

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

FS (Full Scale) = relative to the full measuring range

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

¹⁾ -40 °C valid for process connection G1/2 B DIN EN 837, 1/4 NPT (male, female) and Autoclave, -20 °C for process connection with FKM seal (seal for -40 °C on request)

²⁾ T120 °C, T130 °C only with electrical connection: see 1st page

³⁾ For connection head: Cable gland must cover IP 68 and the 1/2-14 NPT thread must be sealed by thread sealant.

⁴⁾ "Limited Energy" powered according to CAN/UL 61010 (Clause 9.4), Class 2 UL1310, LPS (CAN/UL 60950)

⁵⁾ Measuring ranges ≥ 1000 bar: > 1 million cycles (0 .. 100 % FS)

7. Model code to identify the delivered part

7.1 Model code standard

HDA 4 X X X - X - XXXX - D X - XXX (psi) (XX)

Typ

4 = 1 % FS max.

7 = 0.5 % FS max.

Mechanical connection

1 = G1/2 B DIN EN 837, male

2 = G 1/2 A ISO 1179-2, male

4 = G 1/4 A ISO 1179-2, male

5 = 7/16-20 UNF 2B (SAE4), female

6 = 7/16-20 UNF 2A (SAE4), male

7 = 9/16-18 UNF 2A (SAE6), male

8 = 1/4-18 NPT, male

B = F250 C, Autoclave (9/16-18 UNF 2B) female

C = SF250CX20, Autoclave (7/16-20 UNF 2B) female

F = 1/4-18 NPT, female

W = 1/2-14 NPT, male

Electrical connection

9 = 1/2-14 NPT conduit (male thread), single leads

G = 1/2-14 NPT conduit (male thread), jacketed cable

J = Connection head (aluminum)

Q = Connection head (stainless steel)

U = M20x1.5 conduit (male thread), jacketed cable

W = M20x1.5 conduit (male thread), single leads

Output signal

A = 4...20 mA (2-conductor)

B = 0...10 V (3-conductor)

G = 1...5 V (3-conductor)

0.5...4.5 V (3-conductor) in combination with modification 004

Measuring ranges

Measuring ranges are shown in bar or psi.

(in case of psi, see additional declaration)

- 5 digits if more than 9999 psi -

Approval

D = CSA Explosion Proof - Seal not required

ATEX - Flame Proof

IECEX - Flame Proof

Type of measurement cell

S = Sealed Gauge (sealed to atmosphere)

≥ 40 bar [≥ 500 psi]

V = Vented Gauge (ventilated to atmosphere)

< 40 bar [< 500 psi]

Modification Number

000 = standard

004 = output signal 0.5 .. 4.5 V in conjunction with Signal „G“

On instruments with a different modification number, please read the label or the technical amendment details supplied with the instrument.

(psi)

Additional declaration for psi versions (not applicable for bar version)

Cable length

Indications in *m* or *inch*

7.2 Model code flush mount version

HDA 4 X Z X - X - XXXX - XXX -D X - XXX (psi) (XX)

Typ _____
 4 = 1 % FS
 7 = 0.5 % FS

Mechanical Process connection _____
 Z = Flush membrane

Electrical connection _____
 9 = 1/2-14 NPT conduit (male thread), single leads
 G = 1/2-14 NPT conduit (male thread), jacketed cable
 J = Connection head (aluminum)
 Q = Connection head (stainless steel)
 U = M20x1.5 conduit (male thread), jacketed cable
 W = M20x1.5 conduit (male thread), single leads

Output signal _____
 A = 4...20 mA (2-conductor)
 B = 0...10 V (3-conductor)
 G = 1...5 V (3-conductor)
 0.5...4.5 V (3-conductor)
 in combination with modification 004

Measuring ranges _____
 Measuring ranges are shown in bar or psi.
 (in case of psi, see additional declaration)
 - 5 digits if more than 9999 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 cell _____
 S = Sealed Gauge (sealed to atmosphere) ≥ 40 bar [≥ 500 psi]
 V = Vented Gauge (ventilated to atmosphere) < 40 bar [< 500 psi]

Modification Number _____
 000 = standard
 004 = output signal 0.5 .. 4.5 V in conjunction with Signal „G“
 On instruments with a different modification number, please read the label
 or the technical amendment details supplied with the instrument.

(psi) _____
 Additional declaration for psi versions (not applicable for bar version)

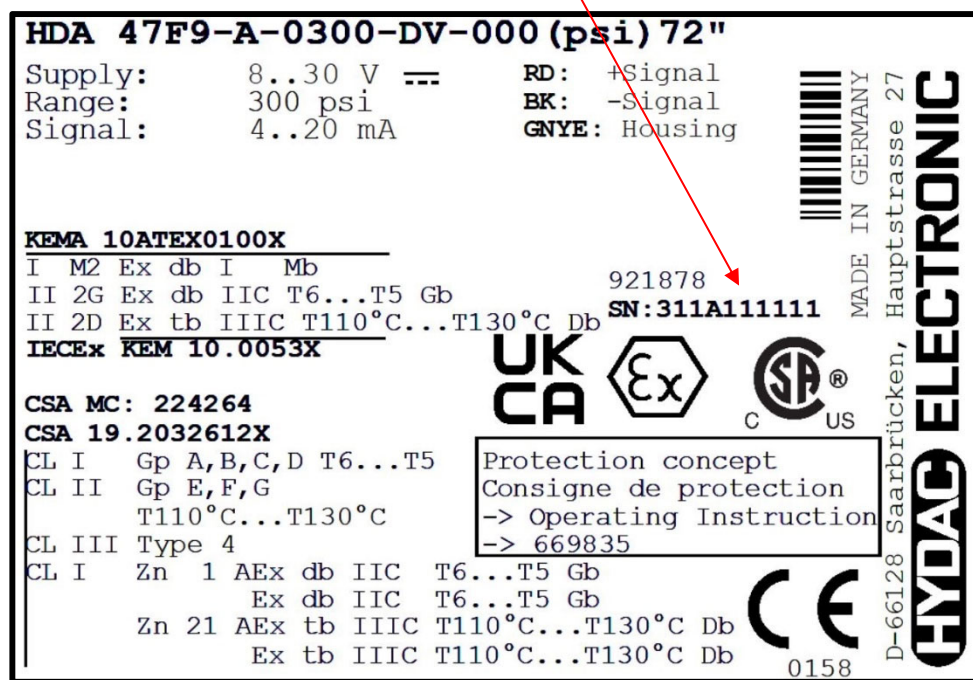
Cable length _____
 Indications in *m* or *inch*

8. 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): xyykzzzzzz

X	Manufacturing year	e.g. : 3 → 2023
yy	Calendar week	e.g.: 11 → CW 11
k	Change control status	e.g.: -, A, B, ...
zzzzzz	Sequential serial number	e.g. 111111



9. PIN connection

Conduit with single leads
 or connection head (screw terminal)

Lead	
red	Signal +
black	Signal -
green-yellow	Housing

Lead	
red	+U _B
white	Signal
black	0 V
green-yellow	Housing

Conduit (jacketed cable)

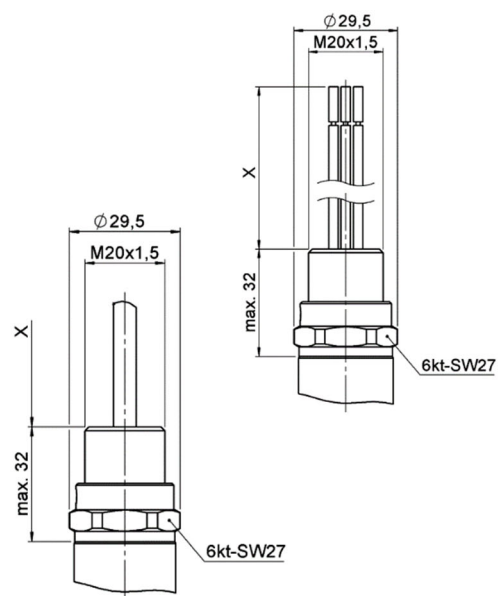
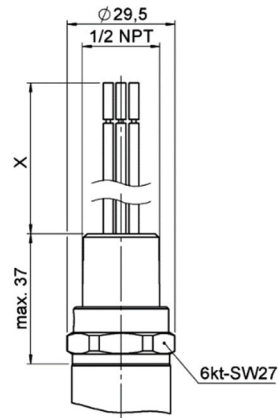
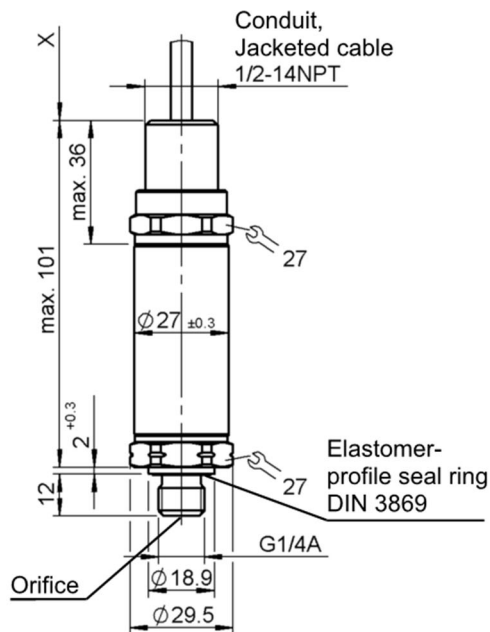
Lead	
brown	Signal +
white	Signal -
green	n.c.
yellow	n.c.

Lead	
brown	+U _B
green	Signal
white	0 V
yellow	n.c.

10. Dimensions

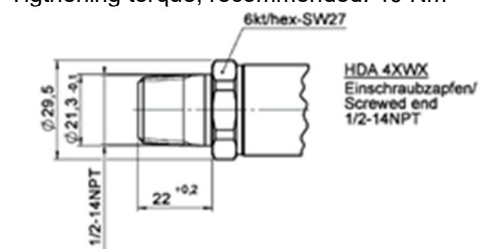
G 1/4 A ISO 1179-2, male

Tightening torque, recommended: 20 Nm



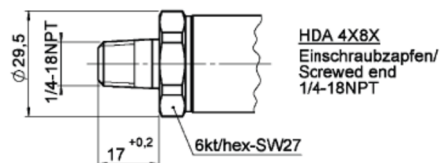
1/2 -14 NPT, male

Tightening torque, recommended: 40 Nm



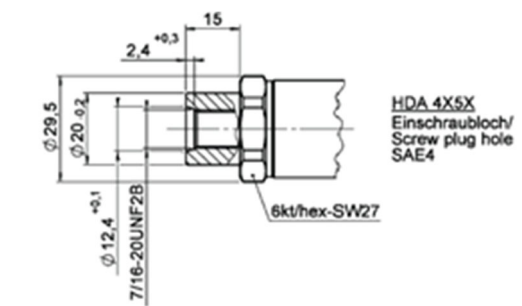
1/4 - 18 NPT, male

Tightening torque, recommended: 40 Nm



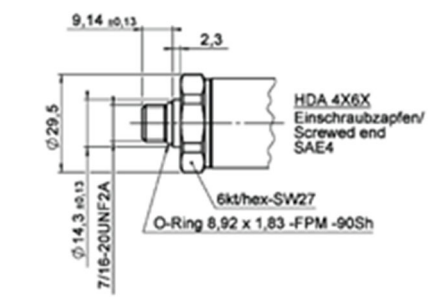
7/16-20 UNF 2B (SAE 4), female

Tightening torque, recommended: 15 Nm



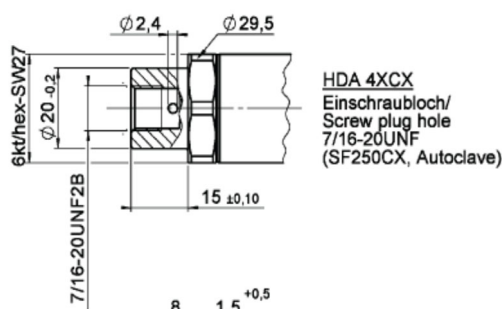
7/16-20 UNF 2A (SAE 4) male

Tightening torque, recommended: 15 Nm



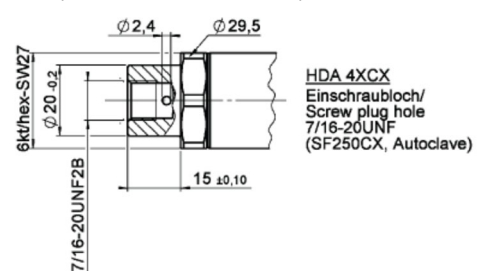
9/16-18 UNF 2A (SAE 6), male

Tightening torque, recommended: 20 Nm

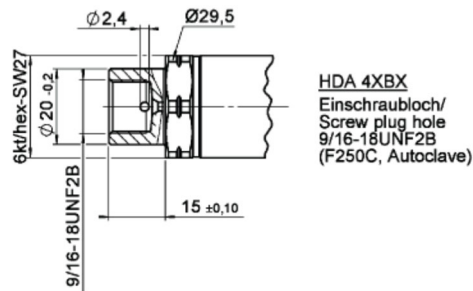


SF 250CX20, Autoclave (7/16-20 UNF 2B), female

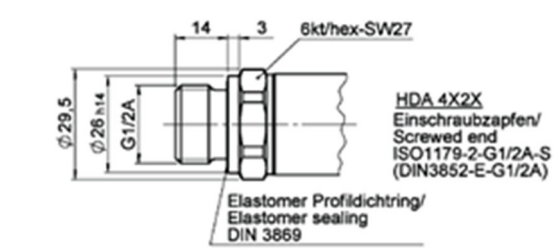
Tightening torque, recommended:
15Nm (up to 600 bar/10000 psi)
30Nm (>600 bar / >10000 psi)



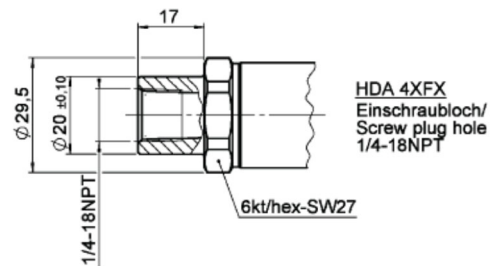
F250 C Autoclave (9/16-18 UNF 2B), female
Tightening torque, recommended: maximal 20 Nm



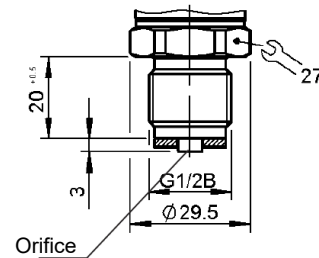
G1/2 A ISO 1179-2, male
Tightening torque, recommended: 45 Nm



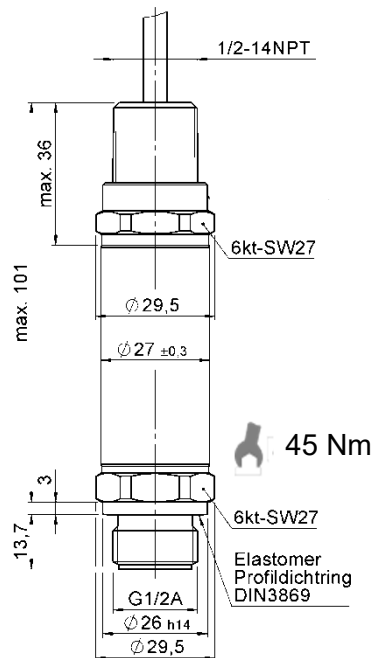
1/4-18 NPT, female
Tightening torque, recommended: maximal 40 Nm



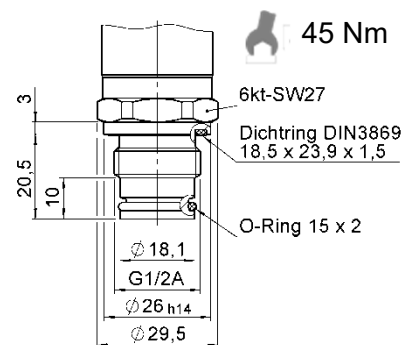
G1/2 B DIN EN 837, male
Tightening torque, recommended: 45 Nm



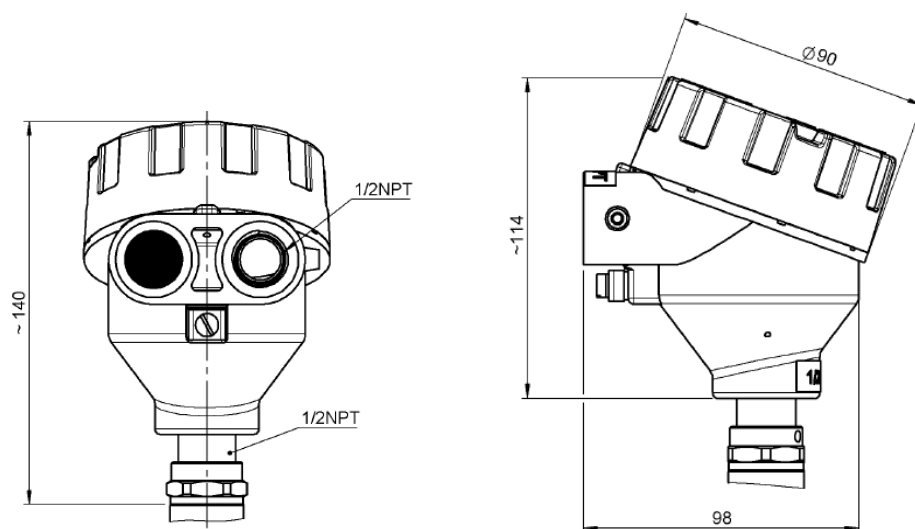
Sensor with flush membrane:



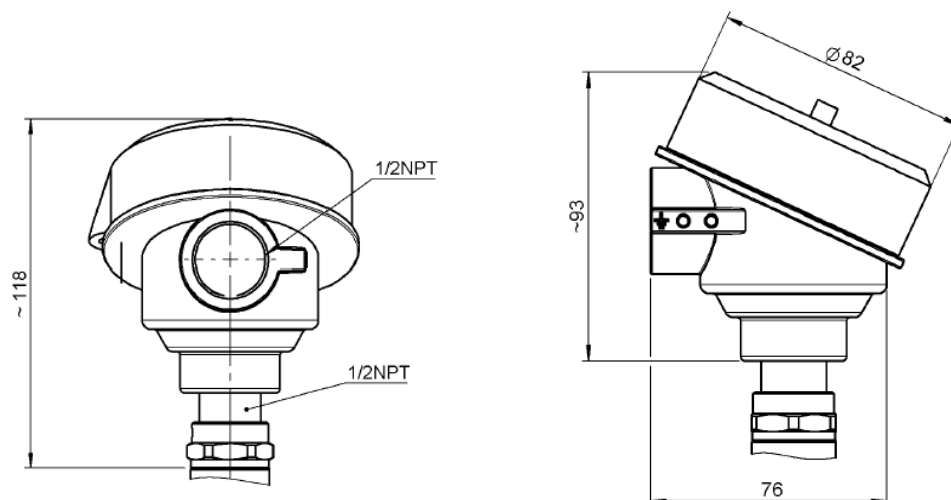
G1/2 with additional front O-ring seal



Connection head aluminum:



Connection head stainless steel:



Notes

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin gray lines. There are no margins, text, or other markings on the page.

HYDAC ELECTRONIC GMBH

Hauptstrasse 27
D-66128 Saarbruecken
Germany

Web: www.hydac.com
E-Mail: electronic@hydac.com
Tel.: +49 (0)6897-509-01
Fax: +49 (0)6897 509-1726

HYDAC SERVICE

For enquiries regarding repairs, please contact HYDAC Service.

HYDAC SERVICE GMBH

Hauptstr. 27
D-66128 Saarbruecken
Germany

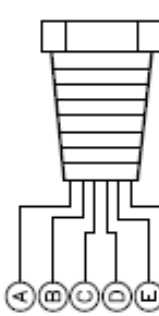
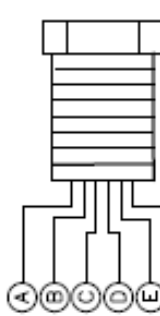
Phone: +49 (0)6897-509-1936
Fax: +49 (0)6897 509-1933

Caution!

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

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

Subject to technical modifications.

1	A	B	C	D	E	F	G	H																									
1	Mise à la terre: Les exigences liées aux normes (voir spécification techniques) ne seront respectées, que si le boîtier du capteur est correctement relié à la terre. La compensation de potentiel doit nécessairement être réalisée. Si des prises MiniMess sont utilisées, le boîtier de chacune d'elles doit être mis à la terre séparément. - L'appareil (capteur) doit être mis à la terre pendant l'installation. - La conformité de la mise à la terre doit être approuvée par l'organisme local d'inspection, ayant juridiction. - Si un fil vert est disponible, celui-ci peut être utilisé pour une mise à la terre supplémentaire de l'appareil, par contre ce fil ne peut pas être utilisé seul en tant que connexion à la terre.																																
2	Grounding: The requirements of the standards (see technical specifications) cannot be satisfied unless the unit's housing is properly grounded. Potential equalization has to be provided. When using hose mounting, the housing has to be grounded separately. -The devices must be grounded during installation. -The suitability of the grounding shall be subject to the acceptance of the local inspection authority having jurisdiction. -If a green wire is available, it can be used additionally for grounding, but may not be used on its own as the grounding connection																																
3																																	
4	cCSAus Class I Groups A,B,C,D, T6, T5, T4A Class II Groups E,F, G, T110°C, T120°C, T130°C Class III Type 4 Class I Zone 1 AEx db IIC T6, T5, T4A Gb Ex db IIC T6, T5, T4A Gb Zone 21 AEx tb IIC T110°C...130°C Db Ex tb IIC T110°C...130°C Db Seal not required Aucun joint d'étanchéité n'est requis ATEX I M2 Ex db I Mb II 2G Ex db IIC T6,T5,T4 Gb II 2D Ex tb IIC T110°C...130°C Db IECEX Ex db I Mb Ex db IIC T6,T5,T4 Gb Ex tb IIC T110°C...130°C Db																																
5	9, G 1/2" NPT male conduit  9 = single leads G = jacketed cable W, U M20x1,5 male conduit  W = single leads U = jacketed cable																																
6	For detailed wiring information see product label																																
7	HYDAC ELECTRONIC 66128 Sbr.-Gersweiler Hauptstr.27 <table border="1"> <tr> <td>A</td> <td>09.04.19</td> <td>Jo/Eitel</td> <td>97329</td> <td>2018</td> </tr> <tr> <td>B</td> <td>gez.</td> <td></td> <td>30.10.</td> <td></td> </tr> <tr> <td>C</td> <td>gepr.FV</td> <td></td> <td></td> <td></td> </tr> <tr> <td>D</td> <td>gepr.EWL</td> <td></td> <td></td> <td></td> </tr> <tr> <td>E</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> HDA4xxx/EDS4xxx Control Drawing Explosion proof/Flame proof 18-326-601-4-66 3931 Bl.3/4								A	09.04.19	Jo/Eitel	97329	2018	B	gez.		30.10.		C	gepr.FV				D	gepr.EWL				E				
A	09.04.19	Jo/Eitel	97329	2018																													
B	gez.		30.10.																														
C	gepr.FV																																
D	gepr.EWL																																
E																																	
8	Ambient Temperature max. +60°C (T6,T110°C) Ambient Temperature max. +70°C (T120°C) Ambient Temperature max. +80°C (T5,T4A,T4,T130°C)																																
	A	B	C	D	E	F	G	H																									

A	B	C	D	E	F	G	H
1	Explosion Proof cCSAus; Enclosures for use in Class I Div. 1 Groups A,B,C,D, T6, T5, T4A Class II Div. 1 Groups E,F, G, T110°C, T120°C, T130°C Class III Type 4 Class I Zone1 AEx db IIC T6,T5,T4A Gb Ex db IIC T6,T5,T4A Gb				For Class I Group A installation and for Zone Conduit seal is required within 18 inches of enclosure Pour une installation de Classe I Groupe A et pour Zone A partir d'une distance de 18 pouces du boîtier, un joint d'étanchéité doit être installé		Junction Box
2	ATEX II 2G Ex db IIC T6,T5,T4 Gb II 2D Ex tb IIC T110°C...130°C Db						J: Aluminium
3	IECEx Ex db IIC T6,T5,T4 Gb Ex tb IIC T110°C...130°C Db						
4	Explosion Proof cCSAus; Enclosures for use in Class I Div. 1 Groups B,C,D, T6, T5, T4A Class II Div. 1 Groups E,F,G, T110°C, T120°C, T130°C Class III Type 4				Open circuit before removing cover Ouvrir le Circuit avant d'enlever couvercle		
5	ATEX II 2G Ex db IIC T6,T5,T4 Gb II 2D Ex tb IIC T110°C...130°C Db						Q: Stainless steel
6	IECEx Ex db IIC T6,T5,T4 Gb Ex tb IIC T110°C...130°C Db					Ambient Temperature max. +60°C (T6; T110°C) max. +70°C (T120°C) max. +80°C (T5, T4A, T4; T130°C)	
7	T6, T5, T4A, T4, T110°C... T130°C, if noted on label si indiqué sur l'étiquette						
8							
				HYDAC ELECTRONIC 66128 Sbr.-Gersweiler Hauptstr.27			
				Control Drawing Explosions proof/Flame proof			
				18-326-601-4-66 3931 Bl.4/4			
A	B	C	D	E	F	G	H

A2 Zertifikat ATEX / Certificate ATEX



CERTIFICATE

EU-Type Examination

- (1) **EU-Type Examination**
- (2) Equipment or protective systems intended for use in potentially explosive atmospheres - Directive 2014/34/EU
- (3) EU-Type Examination Certificate Number: **KEMA 10ATEX0100 X** Issue Number: **6**
- (4) Product: **Pressure Transducers, Pressure Switches, Temperature Transducers, Flow Rate Transmitters, Bladder Integrity Sensors and Connection heads**
- (5) Manufacturer: **HYDAC Electronic GmbH**
- (6) Address: **Hauptstraße 27, 66128 Saarbrücken-Gersweiler, Germany**
- (7) This product and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.
- (8) DEKRA Certification B.V., Notified Body number 0344 in accordance with Article 17 of Directive 2014/34/EU of the European Parliament and of the Council, dated 26 February 2014, certifies that this product has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of products intended for use in potentially explosive atmospheres given in Annex II to the Directive.
The examination and test results are recorded in confidential test report number NL/KEM/ExTR10.0022/06.
- (9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN IEC 60079-0 : 2018	EN 60079-1 : 2014	EN 60079-31 : 2014
-----------------------	-------------------	--------------------

 except in respect of those requirements listed at item 18 of the Schedule.
- (10) If the sign "X" is placed after the certificate number, it indicates that the product is subject to the Specific Conditions of Use specified in the schedule to this certificate.
- (11) This EU-Type Examination Certificate relates only to the design and construction of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this certificate.
- (12) The marking of the product shall include the following:



I M 2	Ex db I Mb
II 2 G	Ex db IIC T6...T4 Gb
II 2 D	Ex tb IIC T110 °C...T130 °C Db

Date of certification: 17 august 2022

DEKRA Certification B.V.



L.G. van Schie
Certification Manager



° Integral publication of this certificate and adjoining reports is allowed. This Certificate may only be reproduced in its entirety and without any change.

DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands

T +31 88 96 83000 F +31 88 96 83100 www.dekra-product-safety.com Registered Arnhem 09085396

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(13) **SCHEDULE**

(14) to EU-Type Examination Certificate KEMA 10ATEX0100 X

Issue No. 6

(15) **Description**

HDA 4xxx

Electronic Pressure Transducer with analogue output.

Depending on the applied pressure on the sensor cell a proportional output signal is generated.

One version has an additional temperature sensor.

It provides an analogue signal or analogue signal combined with a HART digital protocol.

EDS 4xxx

Electronic Pressure switch.

Depending on the applied pressure on the sensor cell a proportional internal signal is generated.

Depending on the factory set fixed value or programmable set point an electronic switch changes its status.

ETS 4xxx

Temperature Transducer

Depending on the applied temperature on the sensor a proportional output signal is generated.

One version has an additional pressure sensor.

It provides an analogue signal or analogue signal combined with a HART digital protocol.

HFT 31xx

Flow Rate Transmitter

An impeller driven by the speed of the flow of the liquid or gas through a turbine generates a signal pick up by a proximity switch, converted to a linear analogue current signal and is available via a HART interface.

BIS 1xxx

Bladder Integrity Sensor

The bladder status signal is provided as a switching signal. Depending on the version, the temperature or pressure signal measured by the sensor is converted into a proportional analogue current signal and is available via a HART interface.

HPT 5xx

Electronic differential pressure transmitter with analogue output.

Depending on the applied differential pressure a piston with integrated magnet is shifted linearly. A Hall sensor is detecting the position and passes on the position to the evaluation electronics which calculates the output signal.

HPS 5xx

Same as HPT 5xx but with an output with an electronic switch.

Optional Connection Heads

Limatherm Type XD-AD and Pushna Type 1016 PSEM Ex d and Ex t certified enclosures.

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Form 227A
Version 2 (2019-06)

(13) **SCHEDULE**

(14) to EU-Type Examination Certificate KEMA 10ATEX0100 X

Issue No. 6

Type Codes

Pressure Transducer	HDA 4abc-d-eeee(e)-fg-hhh(psi)iiij	Standard With temperature measurement With front flush membrane
	HDA 4aZc-d-eeee(e)-kkk-fg-hhh(psi)iiij	
	HDA 4abc-F21-eeee(e)-fg-hhh(iiiij)	
	HDA 4abc-F21-eeee(e)-T-III-fg-hhh(iiiij)	
	HDA 4aZc-F21-eeee(e)-kkk-fg-hhh(iiiij)	
Pressure Switch	EDS 4abc-dddd(d)-ef-gh-iiii(psi)kkkl	Standard With pressure measurement
Temperature Transducer	ETS 45ab-c-d-eee-fff-gggh	
	ETS 4abc-F21-kkk-f-hhh(iiiij)	
	ETS 4abc-F21-kkk-P-eeee(e)-fg-hhh(iiiij)	
Flow Rate Transmitter	HFT 31bc-F21-eeee-S-X-f-hhh(iiiij)	
Bladder Integrity Sensor	BIS 1abc-F21-eeee(e)-fg-hhh(iiiij)	
Difference Pressure Transmitter	HPT 50c-d-eeee-S-f-hhh(psi)iiij	
	HPS 50c-pppp-ef-S-g-hhh(psi)iiij	

Rated ambient temperature range

xxx-xxxx-F21-xxx

-40 °C to +60 °C for T6 and T110 °C

-40 °C to +70 °C for T5 and T120 °C

EDS with max. 2 x 1,2 A output signal

-40 °C to +80 °C for T4

-40 °C to +60 °C for T110 °C

-40 °C to +70 °C for T120 °C

-40 °C to +80 °C for T130 °C

Other

-40 °C to +60 °C for T6 and T110 °C

-40 °C to +70 °C for T120 °C

-40 °C to +80 °C for T5 and T130 °C

For details of the variables refer to Annex 1.

Electrical data

Supply Voltage: 30 Vdc / 6 Vdc for 10%..90% ratiometric

Input Current: 25 mA or 1,3 A

For details refer to Annex 1.

Installation instructions

The instructions provided with the product shall be followed in detail to assure safe operation.

(16) **Report Number**

No. NL/KEM/ExTR10.0022/06.

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Form 227A
Version 2 (2019-06)

(13) **SCHEDULE**

(14) to EU-Type Examination Certificate KEMA 10ATEX0100 X

Issue No. 6

(17) **Specific conditions of use**

The ambient temperature range of the equipment is as indicated at 'Rated ambient temperature range' above.

When used in mining applications a conduit hose or pipe is to be installed at the ½ 14 NPT or M20x1,5 electrical connection and the cable or leads are to run inside the conduit until an area is reached which is not contaminated with chemicals.

Electrostatic charging on non-metallic parts shall be avoided. See installation instructions for details.

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at item (9).

(19) **Test documentation**

As listed in Report No. NL/KEM/ExTR10.0022/06.

(20) **Certificate history**

Issue 1 - 212423500	Initial certificate.
Issue 2 - 215511300	Minor constructional changes and addition of Ex tb
Issue 3 - 216122900	Minor constructional changes, model Type BIS 1000-F added and Name change of the Pressure Transmitter.
Issue 4 - 218185700	Update to the latest standards, changed ambient temperature range and Addition of new type of Temperature Transducer.
Issue 5 - 222806200	Addition of: transmitter HPT500 and HPS500, electrical connection M20x1,5 and optional connection heads;
	Adjustment of type/model codes
Issue 6 - 226247500	Assessment per EN IEC 60079-0: 2018
	Minor constructional changes

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Form 227A
Version 2 (2019-06)

A3 Zertifikat CSA / Certificate CSA



Certificate of Compliance

Certificate: 2032612

Master Contract: 224264

Project: 70194250

Date Issued: July 18, 2019

Issued to: Hydac Electronic GmbH
Dept. ETW
Hauptstrasse 27
66128
Saarbrücken
Germany

Attention: Alwin Eitel

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.



Issued by:

Jens Ensminger

PRODUCTS

CLASS 2258 02 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations

CLASS 2258 82 - PROCESS CONTROL EQUIPMENT - For Hazardous Locations - Certified to US Standards

Class I, Groups A, B, C and D T6 resp. T5 resp. T4A; Class II, Groups E, F and G T110°C resp. T120 °C resp. T130 °C; Class III; Type 4

Class I, Zone 1 AEx db IIC T6 resp. T5 resp. T4A Gb;

Zone 21 AEx tb IIIC T110°C resp. T120 °C resp. T130 °C Db

Ex db IIC T6 resp. T5 resp. T4A Gb; Ex tb IIIC T110°C resp. T120 °C resp. T130 °C Db



Certificate: 2032612
Project: 70194250

Master Contract: 224264
Date Issued: July 18, 2019

• **Pressure Transducer - Standard**

a = accuracy
b = mechanical connection (pressure port)
c = electrical connection

d = signal
e = pressure range

f = approval
g = gauge type
h = modification number
(psi)
i = length of cable
j = cable length definition
 bar-version

HDA 4abc-d-eeee(e)-fg-hhh(psi)iiij

4 or 7 or 8
 any alphanumeric character (not critical to certification)
 9 or G or J (not approved for tb) or
 Q (not approved for Group A, db and tb) or W or U
 any alphabetic character
 4 digits for range in bar or psi
 5 digits for range in psi > 9999
 D or E (not approved for db and tb)
 any alphabetic character (not for f = E)
 alphanumeric value
 (psi) for psi-version or "" for bar-version
 numeric value
 Inch or " or cm or m
 iiij in brackets

Technical data:

Rated Supply Voltage	30 Vdc
Output Signal	0..10 V or 0..20 mA or 4..20 mA
or	
Rated Supply voltage	6 Vdc
Output Signal	10-90% ratiometric
Rated Input Current	25 mA
Maximum working pressure	37 to 30000 psi (0.26 MPa to 206.8 MPa)
Temperature	temperature code T6, T110°C: -40°C...+60°C
	T120°C: -40°C...+70°C
	temperature code T5, T130°C: -40°C...+80°C

• **Pressure Transducer – with front flash membrane**

HDA 4aZc-d-eeee(e)-kkk-fg-hhh(psi)iiij

a = accuracy
Z = pressure port
c = electrical connection

d = signal
e = pressure range

f = approval
g = gauge type
h = modification number
(psi)
i = length of cable
j = cable length definition
k = front flash
 bar-version

4 or 7 or 8
 front flash membrane
 9 or G or J (not approved for tb) or
 Q (not approved for Group A, db and tb) or W or U
 any alphabetic character
 4 digits for range in bar or psi
 5 digits for range in psi > 9999
 D or E (not approved for db and tb)
 any alphabetic character (not for f = E)
 alphanumeric value
 (psi) for psi-version or "" for bar-version
 numeric value
 inch or " or cm or m
 alphanumeric value
 iiij in brackets

Technical data:

Rated Supply Voltage	30 Vdc
Output Signal	0..10 V or 0..20 mA or 4..20 mA
or	
Rated Supply voltage	6 Vdc
Output Signal	10-90% ratiometric
Rated Input Current	25 mA
Maximum working pressure	37 to 15000 psi (0.26 MPa to 103.4 MPa)



Certificate: 2032612
Project: 70194250

Master Contract: 224264
Date Issued: July 18, 2019

Temperature	temperature code T6, T110°C:	-40°C...+60°C
	T120°C :	-40°C...+70°C
	temperature code T5, T130°C:	-40°C...+80°C

• **Pressure Transducer – HART**

HDA 4abc-F21-eeee(e)-fg-hhh(iij) **Standard**
HDA 4abc-F21-eeee(e)-T-III-fg-hhh(iij) **with Temp. Measur.**
HDA 4aZc-F21-eeee(e)-kkk-fg-hhh(iij) **with front flush membr.**

a = accuracy	4 or 7 or 8
b = mechanical connection (pressure port)	any alphanumeric character (not critical to certification)
c = electrical connection	9 or G or J (not approved for tb) or Q (not approved for Group A, db and tb) or W or U
F21 = signal	4..20 mA (with HART Interface)
e = pressure range	4 digits for range in bar or 5 digits for range in psi
f = approval	D
g = gauge type	any alphabetic character
h = modification number	alphanumeric value
i = length of cable	numeric value
j = cable length definition	inch or " or cm or m
Z = pressure port	front flush membrane
k = pressure port	3 digits alphanumeric
T = Temperature measurement	digital with HART Interface
III = probe length	in mm, standard = 007

Technical data:

Rated Supply Voltage	30 Vdc
Output Signal	4..20 mA
Rated Input Current	25 mA
Maximum working pressure	HDA 4abc-F21-eeee(e)-fg... 30000 psi (206.8 MPa)
	HDA 4aZc-F21-eeee(e)-kkk-fg... 30000 psi (206.8 MPa)
	HDA 4abc-F21-eeee(e)-T-III-fg... 10007.6 psi (69.0 MPa)
Temperature	temperature code T6, T110°C: -40°C...+60°C
	temperature code T5, T120°C: -40°C...+70°C

• **Pressure Switch – Standard "approval E - CSA"**

EDS 410-aaaa-b-f-ccc(psi)ddde

a = pressure range	numeric value
b = number of switching outputs	1
f = approval	E (not approved for db and tb)
c = modification number	alphanumeric value
(psi)	(psi) for psi-version or "" for bar-version
d = length of cable	numeric value
e = cable length definition	inch or " or cm or m
bar-version	ddde in brackets

Technical data:

Rated Supply Voltage	30 Vdc
Output Signal	e = 1: 1.2A max
Rated Input Current	1.3 A
Maximum working pressure	100 to 30000 psi (0.69 MPa to 206.8 MPa)
Temperature	temperature code T6: -40°C...+60°C
	temperature code T5: -40°C...+80°C



Certificate: 2032612
Project: 70194250

Master Contract: 224264
Date Issued: July 18, 2019

• **Pressure Switch – Standard**

a = accuracy
b = mechanical connection (pressure port)
c = electrical connection

d = pressure range

e = number of switching outputs
f = output type
g = approval
h = gauge type
i = modification number
(psi)
k = length of cable
l = cable length definition
bar-version

EDS 4abc-dddd(d)-ef-gh-iiii(psi)kkkl

4 or 7
any alphanumeric character (not critical to certification)
9 or G or J (not approved for tb) or
Q (not approved for Group A, db and tb) or W or U
4 digits for range in bar or psi
5 digits for range in psi > 9999
1 or 2
F or P
D
any alphabetic character
alphanumeric value
(psi) for psi-version or "" for bar-version
numeric value
inch or " or cm or m
kkkl in brackets

Technical data:

Rated Supply Voltage
Output Signal

Rated Input Current
Maximum working pressure
Temperature

30 Vdc
e = 1: 1,2A max
e = 2: 0,6A max per output
1.3 A
37 to 30000 psi (0.26 MPa to 206.8 MPa)
temperature code T6, T110°C: -40°C...+60°C
T120°C: -40°C...+70°C
temperature code T5, T130°C: -40°C...+80°C

or

Rated Supply Voltage
Output Signal
Rated Input Current
Maximum working pressure
Temperature

30 Vdc
2: 1.2A max per Output
2.5 A
37 to 30000 psi (0.26 MPa to 206.8 MPa)
temperature code T110°C: -40°C...+60°C
T120°C: -40°C...+70°C
temperature code T4A, T130°C: -40°C...+80°C

• **Temperature Transducer – Standard**

a = mechanical connection
b = electrical connection

c = signal
d = approval
e = probe length
f = modification number
g = length of cable
h = cable length definition

ETS 45ab-c-d-eee-fff(gggh)

any alphanumeric character (not critical to certification)
9 or G or J (not approved for tb) or
Q (not approved for Group A, db and tb) or W or U
any alphabetic character
D
numeric value in mm [max 500]
alphanumeric value
numeric value
inch or " or cm or m

Technical data:

Rated Supply Voltage
Output Signal
Rated Input Current
Maximum working pressure

30 Vdc
0..10 V, 4..20 mA
25 mA
short probe sensor 8702 psi (60.0 MPa)
long probe sensor 1813 psi (12.5 MPa)



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Temperature	temperature code T6, T110°C:	-40°C...+60°C
	T120°C :	-40°C...+70°C
	temperature code T5, T130°C:	-40°C...+80°C

• **Temperature Transducer – HART**

a = accuracy
b = mechanical connection
c = electrical connection

F21
e = pressure range
k = probe length
f = approval
g = gauge type
h = modification number
i = length of cable
j = cable length definition
P = Pressure measurement option

ETS 4abc-F21-kkk-f-hhh(iij)
ETS 4abc-F21-kkk-P-eeee(e)-fg-hhh(iij) **Standard with Press. Measur.**
 1 or 5
 any alphanumeric character (not critical to certification)
 9 or G or J (not approved for tb) or
 Q (not approved for Group A, db and tb) or W or U
 4..20 mA Signal (with HART Interface)
 4 digits for range in bar and 5 digits for range in psi
 in mm [max 500]
 D
 any alphabetic character
 alphanumeric value
 numeric value
 inch or " or cm or m
 digital with HART Interface

Technical data:

Rated Supply Voltage	30 Vdc
Output Signal	4..20 mA
Rated Input Current	25 mA
Maximum working pressure	
	ETS 4abc-F21-kkk-f-hhh(iij) short probe sensor 8702 psi (60.0 MPa)
	ETS 4abc-F21-kkk-f-hhh(iij) long probe sensor 1813 psi (12.5 MPa)
	ETS 4abc-F21-kkk-P-eeee(e)-fg-hhh(iij) 8702 psi (60.0 MPa)
Temperature	temperature code T6, T110°C: -40°C...+60°C
	temperature code T5, T120°C: -40°C...+70°C

• **Flow Rate Transmitter - HART**

b = process connection
c = electrical connection

F21
e = measuring range
S = housing material
X = housing version
f = approval
h = modification number
i = length of cable
j = cable length definition

HFT 31bc-F21-eeee-S-X-f-hhh(iij)
 any alphanumeric character (not critical to certification)
 9 or G or J (not approved for tb) or
 Q (not approved for Group A, db and tb) or W or U
 4..20 mA Signal (with HART Interface)
 4 digits for range l/min
 Stainless Steel

 D
 alphanumeric value
 numeric value
 inch or " or cm or m

Technical data:

Rated Supply Voltage	30 Vdc
Output Signal	4..20 mA
Rated Input Current	25 mA
Maximum working pressure	6090 psi (42.0 MPa)
Temperature	temperature code T6, T110°C: -40°C...+60°C
	temperature code T5, T120°C: -40°C...+70°C



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• **Bladder Integrity Sensor - HART**

a = signal / bladder status
b = mechanical connection
c = electrical connection

F21

e = measuring range
f = approval
g = gauge type
h = modification number
i = length of cable
j = cable length definition

Technical data:

Output Signal
 Rated Supply Voltage
 Rated Input Current
 Maximum working pressure
 Temperature

BIS 1abc-F21-eeee(e)-fg-hhh(iij)

alphanumeric value (not critical for certification)
 2 = G1/2 DIN 3852 male
 9 or G or J (not approved for tb) or
 Q (not approved for Group A, db and tb) or W or U
 4..20 mA Signal (with HART Interface)
 4 digits for range in bar and 5 digits for range in psi
 D or A
 any alphabetic character
 alphanumeric value
 numeric value
 inch or " or cm or m

4..20 mA output
 30 Vdc
 25 mA
 10007.6 psi (69.0 MPa)
 temperature code T6, T110°C: -40°C...+60°C
 temperature code T5, T120°C: -40°C...+70°C

• **Difference Pressure Transmitter - Standard**

c = electrical connection

d = signal
e = measuring range
S = housing material
f = approval
h = modification number
(psi)
i = length of cable
j = cable length definition
 bar-version

Technical data:

Rated Supply Voltage
 Output Signal
 or
 Rated Supply voltage
 Output Signal
 Rated Input Current
 Maximum working pressure
 Temperature

HPT 50c-d-eeee-S-f-hhh(psi)iiij

9 or G or J (not approved for tb) or
 Q (not approved for Group A, db and tb) or W or U
 any alphabetic character
 numeric value
 Stainless Steel
 D
 alphanumeric value
 (psi) for psi-version or "" for bar-version
 numeric value
 inch or " or cm or m
 iiij in brackets

30 Vdc
 0..10 V or 0..20 mA
 6 Vdc
 10-90% ratiometric
 25 mA
 6090 psi (42.0 MPa)
 temperature code T6, T110°C: -40°C...+60°C
 T120°C: -40°C...+70°C
 temperature code T5, T130°C: -40°C...+80°C

• **Difference Pressure Switch - Standard**

c = electrical connection

p = measuring range
e = number of switching outputs
f = set point type
S = housing material

HPS 50c-pppp-ef-S-g-hhh(psi)iiij

9 or G or J (not approved for tb) or
 Q (not approved for Group A, db and tb) or W or U
 numeric value
 1 or 2
 F= Fix or P= programmable
 Stainless Steel



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g = approval
h = modification number
(psi)
i = length of cable
j = cable length definition
 bar-version

D
 alphanumeric value
 (psi) for psi-version or "" for bar-version
 numeric value
 inch or " or cm or m
 iiij in brackets

Technical data:

Rated Supply Voltage 30 Vdc
 Output Signal e = 1: 1.2A max
 e = 2: 0.6A max per output
 Rated Input Current 1.3 A
 Maximum working pressure 6090 psi (42.0 MPa)
 Temperature temperature code T6, T110°C: -40°C...+60°C
 T120°C: -40°C...+70°C
 temperature code T5, T130°C: -40°C...+80°C

Additional explanation to the type code of all models:

Electrical connection

9 = 1/2-14 NPT Conduit (male), Single leads
 G = 1/2-14 NPT Conduit (male), jacketed cable
 J = Connection head, Aluminium
 Q = Connection head, stainless Steel
 W = M20x1.5 Conduit (male) [Draw.no: 4261296; long version], Single Leads
 U = M20x1.5 Conduit (male) [Draw.no: 4261296; long version], jacketed cable
 0 = Special type of connection (not part of CSA Certification):
 M20x1.5 Conduit (male) [Drawing no.: 3654343; short version]

Mechanical connection

1 = G1/2 B DIN EN 837, male
 2 = G1/2 DIN 3852, male
 3 = M14x1.5 DIN 3852, male
 4 = G1/4 A DIN 3852, male
 5 = 7/16-20 UNF 2B (SAE4), female
 6 = 7/16-20 UNF 2A (SAE4), male
 7 = 9/16-18 UNF 2A (SAE6), male
 8 = 1/4-18 NPT, male
 9 = G1/4 DIN 3852 female
 A = 9/16-18 UNF 2B (SAE6), female
 B = F250C, Autoclave(9/16-18 UNF2B, female)
 C = SF250CX20, Autoclave (7/16-20 UNF 2B female)
 D = 1/8-27 NPT male
 E = M10x1 DIN 3852, male
 F = 1/4-18 NPT, female
 G = G1/4 B DIN EN 837, male
 H = 3/4-16 UNF 2A (SAE8), male
 J = G3/4 A DIN 3852 male
 K = 1/4-18 NPTF, male
 L = 1/4-18 NPTF, female
 M = M12x1.5 DIN 3852 male
 N = M20x1 without seal
 P = AM12S38 DIN 3852 male



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R	=	M14x1.5 - ISO6149-2 male
S	=	M18x1.5 male
T	=	G1/8 DIN 3852, male
U	=	G3/8 DIN 3852, male
V	=	SF375CX20, Autoclave (9/16-18 UNF 2B female)
W	=	1/2-14 NPT male
Y	=	G1/2 HN 28-22 male
Z	=	flush mount process connection

I, O and Q are open for different common threads
 Other threads as modification.

Standard signals

A	=	4...20mA	(2-wire)
B	=	max. range 0...10V	(3-wire)
C	=	4...20 mA	(3-wire , current source)
E	=	0...20mA	(3-wire , current source)
G	=	max. range 0...6V	(3-wire)
R	=	10%...90% Ub	(3-wire)
F21	=	4...20mA with HART Interface	

Conditions of Acceptability:

The products are required to be supplied only by certified power supply providing reinforced or double insulation for protection against electric shock with output voltages below the limits of 6.3.1 of 61010-1 or 30 V r.m.s. and 42.4 V peak or 60 V d.c and limited energy circuit according to 9.4 (LPS or Class2).

The equipment was not evaluated to flammable/explosive fluids or liquids.

Equipment is only to be installed by trained personal in accordance to the installation, set-up, operation and maintenance of comparable devices and certified as being capable of such work.

The equipment which is not direct installed to a junction box shall be connected to a conduit installation.

For BIS model: The BIS labc-F21-eeee(e)-fg-hhh(iii) must not be energized when the bladder sensor is located in explosive atmosphere. The sensor can be located only in safe non-hazardous area. The bladder is not covered by this certification. The BIS model is certified as a component only and its final installation must be subjected to acceptance of local authority having jurisdiction.

Notes:

1. Basic model designation is followed by alpha/numeric suffixes denoting type code.
2. The devices must be grounded during installation.
3. The suitability of the grounding shall be subject to the acceptance of the Local Authority Having Jurisdiction.



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APPLICABLE REQUIREMENTS

CAN/CSA Standard C22.2 No. 0-M91 (Reaffirmed 2006)	General Requirements - Canadian Electrical Code, Part II
CSA Standard C22.2 No. 25-1966 (Reaffirmed 2000)	Enclosures for Use in Class II Groups E, F, and G Hazardous Locations
CSA Standard C22.2 No. 30-M1986 (Reaffirmed 2003)	Explosion-Proof Enclosures for Use in Class I Hazardous Locations
CAN/CSA-C22.2 No. 60079-0:15	Explosive atmospheres — Part 0: Equipment — General requirements
CAN/CSA-C22.2 No. 60079-1:16	Explosive atmospheres — Part 1: Equipment protection by flameproof enclosures "d"
CAN/CSA-C22.2 No. 60079-31:15	Explosive atmospheres — Part 31: Equipment dust ignition protection by enclosure "t"
CSA Standard C22.2 No. 94.1-07 (First Edition - September 2007)	Enclosures for Electrical Equipment, Non-Environmental Considerations
CSA Standard C22.2 No. 94.2-07 (First Edition - September 2007)	Enclosures for Electrical Equipment, Environmental Considerations
CAN/CSA-C22.2 No. 61010-1-12	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements
ANSI/UL Standard 50 (Twelfth Edition, September 2007)	Enclosures for Electrical Equipment, Non-Environmental Considerations
ANSI/UL Standard 50E (First Edition, September 2007)	Enclosures for Electrical Equipment, Environmental Considerations
UL 61010-1 (Third Edition)	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 1: General Requirements
ANSI/UL Standard 1203 (Fourth Edition, September 2006)	Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations
UL 60079-0 Sixth Edition	Explosive atmospheres – Part 0: Equipment – General requirements
UL 60079-1 Seventh Edition	Explosive Atmospheres – Part 1: Equipment Protection by Flameproof Enclosures "d"
UL 60079-31 Second Edition	Explosive Atmospheres – Part 31: Equipment Dust Ignition Protection by Enclosure "t"



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MARKINGS

The manufacturer is required to apply the following markings:

- Products shall be marked with the markings specified by the particular product standard.
- Products certified for Canada shall have all Caution and Warning markings in both English and French.

Additional bilingual markings not covered by the product standard(s) may be required by the Authorities Having Jurisdiction. It is the responsibility of the manufacturer to provide and apply these additional markings, where applicable, in accordance with the requirements of those authorities.

The products listed are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US (indicating that products have been manufactured to the requirements of both Canadian and U.S. Standards) or with adjacent indicator 'US' for US only or without either indicator for Canada only.

The following markings are provided on thermally printed silver polyester adhesive nameplates that are manufactured by qMik Industrie-Kennzeichnungen, GmbH, Type qM 442. The nameplates are applied to the outside of the devices' stainless steel enclosures.

The Markings may alternatively be laser engraved onto the stainless steel enclosures.

All products

- Manufacturer name: "Hydac Electronic, GmbH", "Hydac Electronic", "Hydac" or equivalent or CSA Master Contract Number "224264", adjacent to the CSA Mark in lieu of manufacturer name (Note: May be omitted on small labels);
- Certificate Number CSA 19.2032612X;
- Model number: as specified in the PRODUCTS section, above;
- Electrical ratings: as specified in the PRODUCTS section, above;
- Ambient temperature rating: as specified in the PRODUCTS section, above;
- Manufacturing date in MMY format, or serial number, traceable to month of manufacture;
- Enclosure type: "Type 4 Enclosure", "Type 4" or equivalent;
- The CSA Mark with or without "C" and "US" indicators, as shown on the Certificate of Conformity;
- Hazardous Location designation: as specified in the PRODUCTS section, above (may be abbreviated);
- Temperature code: as specified in the PRODUCTS section, above;
- Maximum Working Pressure (MWP): as specified in the PRODUCTS section, above;
- Wiring connections: denotes wiring function by wire color or numbers, as appropriate.

HDA-4000 and EDS-410 Approval E products:

- Reference to Installation Instructions: "Install per 663203".

HDA-4xxx and EDS-4xxx Approval D products with vents

- Reference to Installation Instructions: "Install per 663931"; or
- HDA4xxx: Reference to Operating Instructions (includes Control Drawing: 663931): "Protection concept → Operating Instruction 669835".
 EDS 4xxx: Reference to Operating Instructions (includes Control Drawing: 663931): "Protection concept → Operating Instruction 669837".



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ETS-45xx products:

- Reference to Installation Instructions: "Install per 663928"; or
- Reference to Operating Instructions (includes Control Drawing: 663928): "Protection concept → Operating Instruction 669836".

HDA4 ETS4 HFT3 F2I/ HART models:

- Reference to Installation Instructions: "Install per 663929"; or
- HDA 4 : Reference to Operating Instructions (includes Control Drawing: 663929): "Protection concept → Operating Instruction 669905".
ETS 4: Reference to Operating Instructions (includes Control Drawing: 663929): "Protection concept → Operating Instruction 669907".
HFT 4: Reference to Operating Instructions (includes Control Drawing: 663929): "Protection concept → Operating Instruction 669908".

BIS F21 model:

- Reference to Installation Instructions: "Install per 663930"; or
- Reference to Operating Instructions (includes Control Drawing: 663930): "Protection concept → Operating Instruction 669906".

HPT HPS model:

- Reference to Installation Instructions: "Install per 663932"; or
- Reference to Operating Instructions (includes Control Drawing: 663932): "Protection concept → Operating Instruction 669994".

A4 Zertifikat IECEx / Certificate IECEx

		IECEx Certificate of Conformity	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification System for Explosive Atmospheres for rules and details of the IECEx Scheme visit www.iecex.com			
Certificate No.:	IECEx KEM 10.0053X	Page 1 of 5	<u>Certificate history:</u>
Status:	Current	Issue No: 6	Issue 5 (2019-05-27)
Date of Issue:	2022-08-17		Issue 4 (2015-09-04)
Applicant:	HYDAC Electronic GmbH Hauptstraße 27 66128 Saarbrücken-Gersweiler Germany		Issue 3 (2014-02-06)
Equipment:	Pressure Transducers, Pressure Switches, Temperature Transducers, Flow Rate Transmitters, Bladder Integrity Sensors and Connection heads		
Optional accessory:			
Type of Protection:	Ex db, Ex tb		
Marking:	Ex db I Mb Ex db IIC T6...T4 Gb Ex tb IIC T110 °C...T130 °C Db		
Approved for issue on behalf of the IECEx Certification Body:		L.G. van Schie	
Position:		Certification Manager	
Signature: (for printed version)			
Date: (for printed version)		2022-08-17	
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 www.iecex.com or use of this QR Code.			
Certificate issued by:			
DEKRA Certification B.V. Meander 1051 6825 MJ Arnhem Netherlands			



IECEx Certificate of Conformity

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Date of issue: 2022-08-17

Issue No: 6

Manufacturer: **HYDAC Electronic GmbH**
Hauptstraße 27
66128 Saarbrücken-Gersweiler
Germany

Manufacturing
locations: **HYDAC Electronic GmbH**
Hauptstraße 27
66128 Saarbrücken-Gersweiler
Germany

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 equipment 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 60079-0:2017 Explosive atmospheres - Part 0: Equipment - General requirements
Edition:7.0

IEC 60079-1:2014-06 Explosive atmospheres - Part 1: Equipment protection by flameproof enclosures "d"
Edition:7.0

IEC 60079-31:2013 Explosive atmospheres - Part 31: Equipment dust ignition protection by enclosure "t"
Edition:2

This Certificate does not indicate compliance with 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/ExTR10.0022/06

Quality Assessment Report:

DE/BVS/QAR06.0017/13



IECEx Certificate of Conformity

Certificate No.: **IECEx KEM 10.0053X**

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Date of issue: 2022-08-17

Issue No: 6

EQUIPMENT:

Equipment and systems covered by this Certificate are as follows:

HDA 4xxx

Electronic Pressure Transducer with analogue output.
Depending on the applied pressure on the sensor cell a proportional output signal is generated.
One version has an additional temperature sensor.
It provides an analogue signal or analogue signal combined with a HART digital protocol.

EDS 4xxx

Electronic Pressure switch.
Depending on the applied pressure on the sensor cell a proportional internal signal is generated.
Depending on the factory set fixed value or programmable set point an electronic switch changes its status.

ETS 4xxx

Temperature Transducer.
Depending on the applied temperature on the sensor a proportional output signal is generated.
One version has an additional pressure sensor.
It provides an analogue signal or analogue signal combined with a HART digital protocol.

HFT 31xx

Flow Rate Transmitter.
An impeller driven by the speed of the flow of the liquid or gas through a turbine generates a signal pick up by a proximity switch, converted to a linear analogue current signal and is available via a HART interface.

BIS 1xxx

Bladder Integrity Sensor.
The bladder status signal is provided as a switching signal. Depending on the version, the temperature or pressure signal measured by the sensor is converted into a proportional analogue current signal and is available via a HART interface.

HPT 5xx

Electronic differential pressure transmitter with analogue output.
Depending on the applied differential pressure a piston with integrated magnet is shifted linearly. A Hall sensor is detecting the position and passes on the position to the evaluation electronics which calculates the output signal.

HPS 5xx

Same as HPT 5xx but with an output with an electronic switch.

Optional Connection Heads

Limatherm Type XD-AD and Pushna Type 1016 PSEM Ex d and Ex t certified enclosures.

SPECIFIC CONDITIONS OF USE: YES as shown below:

The ambient temperature range of the equipment is as indicated at 'Rated ambient temperature range' below.

When used in mining applications a conduit hose or pipe is to be installed at the 1/2-14 NPT or M20x1.5 electrical connection and the cable or leads are to run inside the conduit until an area is reached which is not contaminated with chemicals.

Electrostatic charging on non-metallic parts shall be avoided. See installation instructions for details.



IECEx Certificate of Conformity

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Date of issue: 2022-08-17

Issue No: 6

Equipment (continued):

Type Codes

Pressure Transducer

HDA4abc-d-eeee(e)-fg-hhh(psi)iii
HDA 4aZc-d-eeee(e)-kkk-fg-hhh(psi)iii
HDA 4abc-F21-eeee(e)-fg-hhh(iii) Standard
HDA 4abc-F21-eeee(e)-T-III-fg-hhh(iii) With temperature measurement
HDA 4aZc-F21-eeee(e)-kkk-fg-hhh(iii) With front flush membrane

Pressure Switch

EDS 4abc-dddd(d)-ef-gh-iii(psi)kkkl

Temperature Transducer

ETS 45ab-c-d-eee-fff-gggh
ETS 4abc-F21-kkk-f-hhh(iii) Standard
ETS 4abc-F21-kkk-P-eeee(e)-fg-hhh(iii) With pressure measurement

Flow Rate Transmitter

HFT 31bc-F21-eeee-S-X-f-hhh(iii)

Bladder Integrity Sensor

BIS 1abc-F21-eeee(e)-fg-hhh(iii)

Difference Pressure Transmitter

HPT 50c-d-eeee-S-f-hhh(psi)iii
HPS 50c-pppp-ef-S-g-hhh(psi)iii

Rated ambient temperature range

xxx-xxx-F21-xxx
-40 °C to +60 °C for T6 and T110 °C
-40 °C to +70 °C for T5 and T120 °C

EDS with max. 2 x 1.2 A output signal

-40 °C to +80 °C for T4
-40 °C to +60 °C for T110 °C
-40 °C to +70 °C for T120 °C
-40 °C to +80 °C for T130 °C

Other

-40 °C to +60 °C for T6 and T110 °C
-40 °C to +70 °C for T120 °C
-40 °C to +80 °C for T5 and T130 °C

For details of the variables refer to Annex 1.



IECEx Certificate of Conformity

Certificate No.: IECEx KEM 10.0053X

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Date of issue: 2022-08-17

Issue No: 6

DETAILS OF CERTIFICATE CHANGES (for issues 1 and above)

Assessment per IEC 60079-0 : 2017 Ed. 7.0

Minor constructional changes

Annex:

[226247500-ExTR10.0022.06 Annex1_1.pdf](#)

A5 EU- Konformitätserklärung / EU declaration of conformity



HYDAC Electronik GmbH, Hauptstraße 27, 66128 Saarbrücken

HYDAC ELECTRONIC GMBH

Hauptstraße 27
66128 Saarbrücken, Germany

Phone exchange: (0049) 6897 509-01
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Fax sales dept.: (0049) 6897 509-1735
E-Mail: support.electronic@hydac.com
website: www.hydac.com
see also: General Terms of Use (AGB)



EU-Konformitätserklärung / EU declaration of conformity 18 / 216a / 2023

Hiemit erklären wir in alleiniger Verantwortung, dass das nachfolgend bezeichnete Produkt auf Grund seiner Konzeption und Bauart, sowie in der von uns in Verkehr gebrachten Ausführung, den grundlegenden Sicherheits- und Gesundheitsanforderungen der unten aufgeführten Richtlinien/Verordnungen entspricht.

We herewith declare under our sole responsibility that, with regard to its design and construction and to the model brought onto the market by us, the product designated below conforms with the fundamental safety and health requirements of the directive/regulation listed below.

Bezeichnung / Designation	Druckmessumformer für explosionsgefährdete Umgebungen (Druckfeste Kapselung) / Pressure transmitter for potentially explosive atmospheres (Flameproof enclosure)
Typ / Type	HDA 4xxx ... Ax ... HDA 4xxx ... Dx ...
EMV Richtlinie / EMV Guideline	2014/30/EU
Normen / Standards	EN 61000-6-1:2007 EN 61000-6-2:2005 EN 61000-6-3:2012 EN 61000-6-4:2011
Baumusterprüfbescheinigung / Type Examination Certificate	KEMA 10ATEX0100X DEKRA Certification B.V.

Geschäftsführer:
Dr. Franz Josef Eckle, Matthias Dieter,
Dr. Carlos-Javier Moran-Iglesias

Sitz der Gesellschaft: Saarbrücken
Registergericht:
Saarbrücken, HRB 8707

USt-Identnummer: DE 138 277 433
Steuernummer: 040/11050684

Bankverbindung in Saarbrücken:

Commerzbank AG
Nr. 3168888 BLZ 590 800 00
BIC DRESDEFF330
IBAN DE77 5908 0000 0316 8888 00

Deutsche Bank AG
Nr. 0355800, BLZ 590 700 00
BIC DEUTDE33HAN
IBAN DE54 5907 0000 0035 5800 00

Landesbank Saar
Nr. 5250008 BLZ 590 500 00
BIC SALADE33XXX
IBAN DE51 5905 0000 0005 2500 08

HypoVereinsbank
Nr. 353568254, BLZ 590 200 00
BIC HYVEDE33HAN
IBAN DE58 5902 0000 0353 5682 64

Deutsche Postbank
Nr. 203966 BLZ 590 100 00
BIC PBNKDE33HAN
IBAN DE87 5901 0000 0000 2039 66

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ATEX		2014/34/EU
	I M2 Ex db I Mb	EN IEC 60079-0:2018
	II 2G Ex db IIC T6,T5 Gb	EN 60079-1:2014
	II 2D Ex tb IIC T110°C...T130°C Db	EN 60079-31:2014
27 th February 2023	ppa C. Krupp	
Date	Name	(UKCA-authorized person)

A6 UKCA-Konformitätserklärung / UKCA declaration of conformity

		
HYDAC Electronic GmbH, Hauptstraße 27, 66128 Saarbrücken		
	HYDAC ELECTRONIC GMBH Hauptstraße 27 66128 Saarbrücken, Germany Phone exchange: (0049) 6897 509-01 Fax purchasing dept.: (0049) 6897 509-1745 Fax sales dept.: (0049) 06897 509-1735 E-Mail: support.electronic@hydac.com website: www.hydac.com see also: General Terms of Use (AGB)	
	Authorised to compile the technical documentation: HYDAC TECHNOLOGY LIMITED De Havilland Way, Windrush Park WITNEY, Oxfordshire, GB-OX29 0YG Phone exchange: (0044) 1993 / 86 63 66 Fax: (0044) 1993 / 86 63 65 E-Mail: info@hydac.co.uk website: www.hydac.com	
	UKCA – Declaration of Conformity	
	18 / 15a / 2023	
	We herewith declare under our sole responsibility that, with regard to its design and construction and to the model brought onto the market by us, the product designated below conforms with the fundamental safety and health requirements of the standards listed below.	
	Designation	Pressure transmitter for potentially explosive atmospheres (Flameproof enclosure)
	Type	HDA 4xxx ... Ax ... HDA 4xxx ... Dx ...
	EMV Richtlinie / EMV Guideline	2014/30/EU
	Designated Standards	EN 61000-6-1:2007 EN 61000-6-2:2005 EN 61000-6-3:2012 EN 61000-6-4:2011
	Type Examination Certificate	KEMA 10ATEX0100X DEKRA Certification B.V.
Managing Directors: Dr. Franz Josef Eckle, Mathias Dieter, Dr. Carlos-Javier Moran-Iglesias Corporate seat: Saarbrücken Registration court: Saarbrücken, HRB 8707 Tax-ID (USt-ID): DE 138 277 433 Tax number: 040/110/50684	Bank account in Saarbrücken: Commerzbank AG No. 3168888 BCN 590 800 90 BIC DRESDE33HAN IBAN DE77 5908 0090 0316 8888 00	
Deutsche Bank AG No. 0355800, BCN 590 700 00 BIC DEUTDE33HAN IBAN DE54 5907 0000 0035 5800 00 Landesbank Saar No. 5250006 BCN 590 500 00 BIC SALADE33HAN IBAN DE51 5905 0000 0005 2500 06	HypoVereinsbank No. 35358254, BCN 590 200 90 BIC HYVEDE33HAN IBAN DE58 5902 0090 0353 5882 64 Deutsche Postbank No. 203666 BCN 590 100 66 BIC PBNKDE33HAN IBAN DE87 5901 0066 0000 2036 66	

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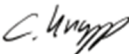
ATEX

2014/34/EU

	I M2 Ex db I Mb	EN IEC 60079-0:2018
	II 2G Ex db IIC T6,T5 Gb	EN 60079-1:2014
	II 2D Ex tb IIC T110°C...T130°C Db	EN 60079-31:2014

27th February 2023
Date

ppa C. Krupp
Name



(UKCA-authorized person)

Notes

This image shows a full page of blank graph paper. The grid consists of small, uniform squares formed by thin gray lines. There are no margins, text, or other markings on the page.

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HYDAC SERVICE

For enquiries regarding repairs, please contact HYDAC Service.

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Caution!

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

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

Subject to technical modifications.