

Bedienungsanleitung

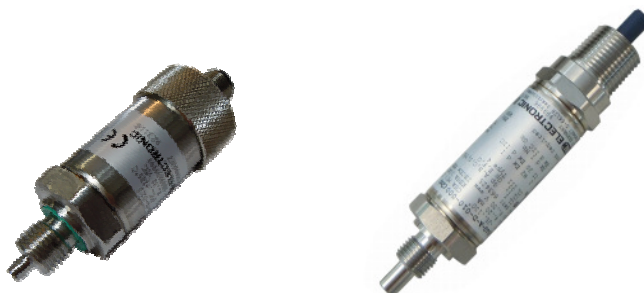
Temperaturmessumformer Serie ETS 4000

mit HART Schnittstelle für eigensichere Stromkreise und Schutz durch Gehäuse mit ATEX und IECEx-Zulassung
(Original- Bedienungsanleitung)

Operating Instructions

Temperature Transmitter Series ETS 4000

*with HART interface for intrinsically safe circuits and protection by enclosure with ATEX and IECEx approval
(Translation of the original operating instructions)*



Schutzklassen und Einsatzbereiche / Protection Types and Zones:

ATEX		
13ATEX0031X	I M1	Ex ia I Ma
	II 1G	Ex ia IIC T6,T5 Ga
	II 1/2 G	Ex ia IIC T6,T5 Ga/Gb
	II 2 G	EX ia IIC T6,T5 Gb
	II 1D	Ex ia IIIC T85°C or T95°C Da
	II 1D	Ex ta IIIC T80/90/100°C T ₅₀₀ T90/T100/T110 °C Da
13ATEX0032	II 2D	Ex tb IIIC T80/90/100°C Db
	II 3G	Ex nA IIC T6, T5, T4 Gc
	II 3G	Ex ic IIC T6, T5, T4 Gc
	II 3D	Ex tc IIIC T80/T90/T100°C Dc
	II 3D	Ex ic IIIC T80/T90/T100°C Dc
IECEx		
IECEx DEK 14.0011X	Ex ia I Ma	
	Ex ia IIC T6,T5 Ga	
	Ex ia IIC T6,T5 Ga/Gb	
	Ex ia IIC T6,T5 Gb	
	Ex ia IIIC T85°C or T95°C Da	
	Ex ta IIIC T80/90/100 °C Da T ₅₀₀ 90/100/110 °C Da	
	Ex tb IIIC T80/90/100 °C Db	
	Ex nA IIC T6/ T5 T4 Gc	
	Ex ic IIC T6/ T5/T4 Gc	
	Ex tc IIIC T80/90/100 °C Dc	
	Ex ic IIIC T80/90/100 °C Dc	

ATEX Zertifikat: DEKRA 13ATEX0031 X
DEKRA 13ATEX0032
IECEx Zertifikat: IECEx DEK 14.0011X

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1 Allgemeines

Falls Sie Fragen bezüglich der technischen Daten oder Eignung für Ihre Anwendungen haben, wenden Sie sich bitte an unseren **technischen Vertrieb**. Die Temperaturmessumformer ETS 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. Falls 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 und IECEx Zulassung.

2 Funktion

Das vom Sensor gemessene Temperatursignal wird in ein analoges 4..20 mA Signal umgewandelt. Neben der analogen Ausgabe des Messwertes ist eine digitale Kommunikation mit Hilfe des HART Protokolls möglich. Der elektrische Anschluss erfolgt über einen Steckverbinder oder eine fest angeschlossene Leitung.

3 Montage und Inbetriebnahme

Die Temperaturmessumformer können auf Prozess-Seite direkt über den Gewindeanschluss montiert werden. Der Temperatursensor ist in dem vor dem Gewinde befindlichen Zapfen integriert. Um eine korrekte Temperaturmessung durchzuführen, muss sichergestellt werden, dass sich dieser Zapfen im Volumenstrom des Fluides befindet.

Anzugsdrehmoment siehe Abmessungen.

Die Installation muss von einem Fachmann nach den jeweiligen Landesvorschriften zu potentiell explosionsgefährdeten Umgebungen durchgeführt werden (z.B. IEC / EN 60079-14). Die Temperaturmessumformer der Serie ETS 4000 tragen das **CE** - Zeichen. Die Konformitätserklärung befindet sich im Anhang.

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

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

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

Temperaturmessumformer mit Option Druckmessung

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

Bei Geräten mit einem Nenndruck von ≤ 100 bar (≤ 1500 psi) und einem ½ NPT Conduit befindet sich diese Bohrung am ½ NPT Conduit.

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

Einbau gemäß Kontrollzeichnungen Nr. 663653 (siehe Kapitel 12).

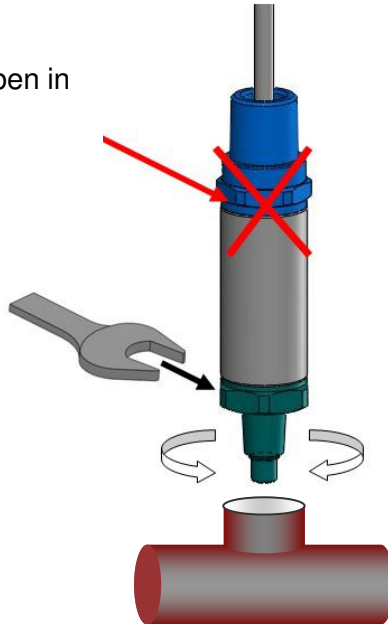
4 Wichtige Hinweise für die Conduit-Installation

4.1 Installationshinweise für Geräte mit 1/2 " NPT Conduit

Mechanische Installation

Für die Montage des Prozessanschlusses darf nur die Schlüssel­fläche 27mm an der Prozessanschlus­seite des Temperaturmessumformers verwendet werden.

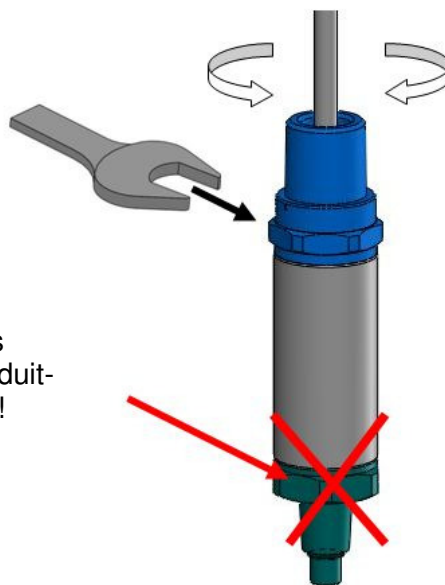
Nicht zum Einschrauben in die Hydraulikleitung verwenden!



Elektrische Installation

Die Schlüssel­fläche an der Seite des elektrischen Anschlusses am 1/2 NPT Conduit dient nur zum Fixieren des Temperaturmessumformers bei der Conduit-Installation.

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



4.2 Installationshinweise für Geräte mit Schlagschutz

Installationshinweise für Geräte mit M12x1 Stecker mit Schlagschutz-/Sicherungs- Metallhülse für den Einsatz in:

ATEX

II 3G Ex nA IIC T6,T5 Gc

II 1D Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da

II 2D Ex tb III C T80/T90°C Db

IECEx

Ex nA IIC T6,T5 Gc

Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da

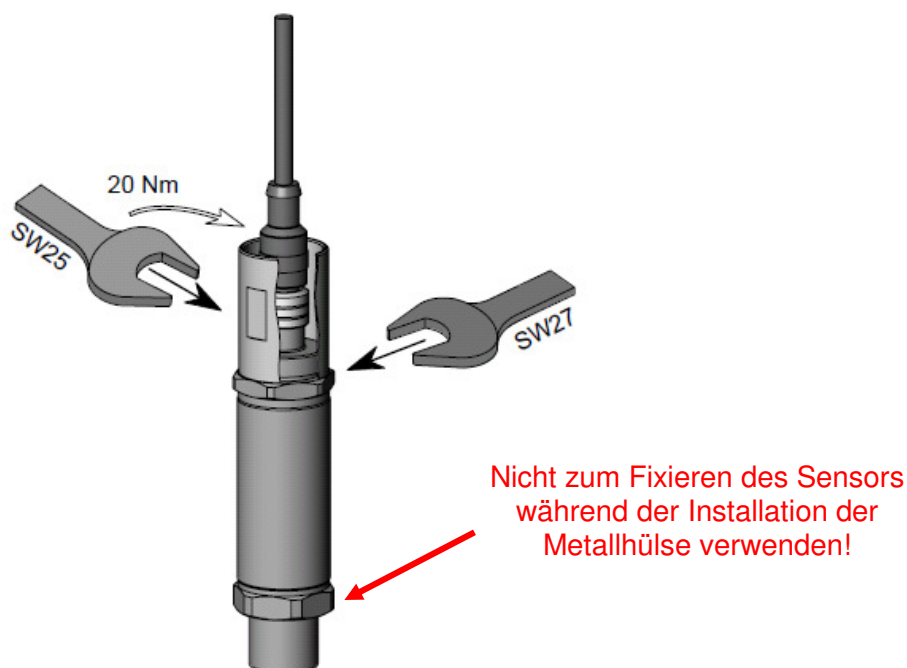
Ex tb III C T80/T90°C Db

Zur Einhaltung der Sicherheitsrichtlinien ist, für diese Schutzklassen und Einsatzbereiche, die Verwendung der Schlagschutz-/ Sicherungs- Metallhülse zwingend erforderlich.

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

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

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





5 Allgemeine Sicherheitshinweise

Wenn das Etikett nicht mehr lesbar ist, muss der Temperaturmessumformer außer Betrieb gesetzt werden.

Sicherheitsbarrieren zum Anschluss der Temperaturmessumformer sind generell in Zündschutzart "ia" auszuführen.

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

Es ist unbedingt auf die Verträglichkeit der Messmedien zu den Dichtungen und den verwendeten Werkstoffen des Temperaturmessumformers zu achten. Ebenso sind die im Zertifikat angegebenen "Sicherheitstechnische Daten" einzuhalten.

Temperaturmessumformer mit Option Druck

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

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

Ebenso ist auf eine ausreichende Dichtung zwischen den Zonen zu achten.

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

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

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

Zur Einhaltung der Sicherheitsrichtlinien ist für die Schutzklassen und Einsatzbereiche:

ATEX: II 3G Ex nA IIC T6,T5 Gc / II 1D Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da /
II 2D Ex tb III C T80/T90°C Db

IECEx: Ex nA IIC T6,T5 Gc / Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da /
Ex tb III C T80/T90°C Db

die Verwendung der Schlagschutz-/ Sicherungs- Metallhülse zwingend erforderlich.

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

6 Technische Daten

6.1 ETS 4000 Standard ohne Option Druckmessung

Eingangskenngrößen	ETS 4100	ETS 4500
Messelement	Silizium-Halbleiter	
Messbereich	-25 .. +100 °C [-13 .. +212 °F]	
Fühlerlänge	10,4 (SAE6); 10,7 (G1/4); 50; 100; 250; 350 mm	
Druckfestigkeit	600 bar [8700 psi] Fühlerlänge 10,4/ 10,7 mm [0,409/ 0,421 Inch] 125 bar [1800 psi] Fühlerlänge 50 mm [1,97 Inch] 125 bar [1800 psi] Fühlerlänge 100 mm [3,937 Inch] 125 bar [1800 psi] Fühlerlänge 250 mm [9,843 Inch] 125 bar [1800 psi] Fühlerlänge 350 mm [13,779 Inch]	
Mechanischer Anschluss	G1/4 A ISO 1179-2 (DIN 3852) 9/16-18 UNF 2A (SAE6) 1/4-18 NPT	
Anzugsdrehmoment	siehe Abmessungen	
Medien berührende Teile	1.4571(316Ti); 1.4301 (304) Dichtung: FPM (SAE6 und G1/4)	
Conduit / Gehäusewerkstoff	1.4404 (316L)	
Ausgangsgrößen		
Ausgangssignal	4 .. 20 mA über HART Protokoll	
HART Kommunikation	gemäß HART 7 Spezifikation	
HART Common Practice Commands z.B.	Änderung der Messbereichsgrenzen (siehe Tabelle)	
Zulässige Bürde	$R_{Lmax} = (U_B - 12 \text{ V}) / 20 \text{ mA [k}\Omega\text{]}$, für HART Kommunikation min. 250 Ω	
Genauigkeit (bei Raumtemperatur)	$\leq \pm 0,4 \text{ \% FS typ.}$ $\leq \pm 0,8 \text{ \% FS max.}$	$\leq \pm 1,0 \text{ \% FS typ.}$ $\leq \pm 2,0 \text{ \% FS max.}$
Temperaturdrift	$\leq \pm 0,01 \text{ \% FS/}^\circ\text{C}$ [0,006 % FS/°F]	$\leq \pm 0,02 \text{ \% FS/}^\circ\text{C}$ [0,01 % FS/°F]
Anstiegszeit nach DIN EN 60751	t_{50} : ~ 10 s t_{90} : ~ 15 s	
Umgebungsbedingungen		
Betriebs- /Umgebungstemperaturbereich ¹⁾	T6,T80,T85°C,T ₅₀₀ 90 Ta=-40..+60°C/-20 .. +60°C[-40 .. +140°F/-4 .. +140 °F] T5,T90,T95°C,T ₅₀₀ 100 Ta=-40..+70°C/-20 .. +70 °C[-40 .. +158°F/-4 .. +158 °F] T100,T ₅₀₀ 110 Ta=-40..+80°C/-20 .. +80 °C[-40 .. +176°F/-4 .. +176 °F] T4 Ta=-40..+85°C/-20 .. +85 °C[-40 .. +185°F/-4 .. +185 °F]	
Mediumstemperaturbereich ¹⁾	T6,T80,T85°C,T ₅₀₀ 90 Ta=-40..+60°C/-20 .. +60°C[-40 .. +140°F/-4 .. +140 °F] T5,T90,T95°C,T ₅₀₀ 100 Ta=-40..+70°C/-20 .. +70 °C[-40 .. +158°F/-4 .. +158 °F] T100,T ₅₀₀ 110 Ta=-40..+80°C/-20 .. +80 °C[-40 .. +176°F/-4 .. +176 °F] T4 Ta=-40..+85°C/-20 .. +85 °C[-40 .. +185°F/-4 .. +185 °F]	
Lagertemperaturbereich	-40 .. +100 °C [-40 .. +212 °F]	
CE - Zeichen	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0/ 11/ 15/ 26/ 31	
Vibrationsbeständigkeit nach IEC 60068-2-6 bei 10 ..500 Hz	$\leq 20 \text{ g}$ $\leq 10 \text{ g}$ (mit 1/2 NPT Conduit)	
Schutzart nach IEC 60529 ³⁾ ISO 20653	IP 67 (Gerätestecker M12x1, EN175301-803) IP 6K9K (mit 1/2 NPT Conduit)	
Relevante Daten für Ex-Anwendungen	Ex ia, ic	Ex nA, ta, tb, tc
Versorgungsspannung	12...28 VDC	12...28 VDC
Maximaler Speisestrom	$I_i = 100 \text{ mA}$	
Maximale Speiseleistung	$P_i = 0,7 \text{ W}$	Max. Leistungsaufnahme $\leq 1 \text{ W}$
Anschlusskapazität des Sensors	$C_i = \leq 22 \text{ nF}$	
Induktivität des Sensors	$L_i = 0 \text{ mH}$	
Isolationsspannung	50 VAC, mit integriertem Überspannungsschutz nach EN 61000-6-2	
Sonstige Größen		
Restwelligkeit Versorgungsspannung	46 bis 125 Hz: < 0,2 Vpp >125 Hz: <1,2 mV RMS	
Gewicht	ca. 280 g Fühlerlänge 10,4/10,7 mm [0,409/ 0,421 Inch] ca. 300 g Fühlerlänge 50 mm [1,97 Inch] ca. 315 g Fühlerlänge 100 mm [3,937 Inch] ca. 350 g Fühlerlänge 250 mm [9,843 Inch] ca. 385 g Fühlerlänge 350 mm [13,779 Inch]	

Hinweise:

FS (Full Scale) = bezogen auf den vollen Messbereich

¹⁾ -20 °C [-4 °F] mit FPM Dichtung, Dichtungsmaterial bis -40 °C [-40 °F] auf Anfrage

²⁾ mit M12x1 Stecker nur bis -25 °C [-13 °F] möglich

³⁾ bei montierter Kupplungsdose entsprechender Schutzart

6.2 ETS 4000 mit Option Druckmessung

Allgemeingültige techn. Daten: Siehe 6.1 ETS 4100 / ETS 4500 Standard

Zusätzliche technische Daten mit Option Druckmessung:

Eingangsgrößen		ETS 4100				ETS 4500		
Messbereich	bar	16	40	60	100	250	400	600
Überlastbereich	bar	32	80	120	200	500	800	1000
Berstdruck	bar	100	200	300	500	1000	2000	2000
Messbereich	psi	300	500	1000	3000	5000	6000	9000
Überlastbereich	psi	725	1160	2900	7250	11600	11600	14500
Berstdruck	psi	1800	2900	7250	14500	29000	29000	29000
Mechanischer Anschluss		G 1/2 A DIN 3852 mit Fühler						
Anzugsdrehmoment		Siehe Abmessungen						
Medienberührende Teile		Edelstahl: 1.4542(630); 1.4548(630) Dichtung: FPM						
Fühlerlänge		7 mm						
Ausgangsgrößen								
Ausgangssignal Druck		Das Drucksignal ist als Sekundärvariable über HART Protokoll als digitales Signal verfügbar.						
Genauigkeit nach DIN16086	Typ.	≤ ± 0,25 % FS				≤ ± 0,5 % FS		
Grenzpunkteinstellung	Max	≤ ± 0,5 % FS				≤ ± 1,0 % FS		
Genauigkeit bei Kleinstwerteinstellung (B.F.S.L.)	Typ.	≤ ± 0,15 % FS				≤ ± 0,25 % FS		
	Max	≤ ± 0,25 % FS				≤ ± 0,5 % FS		
Temperaturkompensation	Typ.	≤ ± 0,008 % / °C [0,004% FS / °F]				≤ ± 0,015 % / °C [0,008% FS / °F]		
Nullpunkt	max	≤ ± 0,015 % / °C [0,008% FS / °F]				≤ ± 0,025 % / °C [0,014% FS / °F]		
Temperaturkompensation	Typ.	≤ ± 0,008 % / °C [0,004% FS / °F]				≤ ± 0,015 % / °C [0,008% FS / °F]		
Spanne	max	≤ ± 0,015 % / °C [0,008% FS / °F]				≤ ± 0,025 % / °C [0,014% FS / °F]		
Nicht-Linearität bei Grenzpunkt-einstellung nach DIN 16086	max	≤ ± 0,3% FS				≤ ± 0,3% FS		
Hysterese	max	≤ ± 0,1 % FS				≤ ± 0,4 % FS		
Wiederholbarkeit		≤ ± 0,05 % FS				≤ ± 0,1 % FS		
Langzeitdrift	Typ.	≤ ± 0,1 % FS / Jahr				≤ ± 0,3 % FS / Jahr		
Umgebungsbedingungen								
Kompensierter Temperaturbereich		-25 .. +85 °C						
Schutzart nach IEC 60529 ¹⁾		IP 65 (bei ½ NPT Conduit ≤ 100 bar) IP 67 (Gerätestecker M12x1, EN175301-803) IP 6K9K (bei ½ NPT Conduit > 100 bar)						
ISO 20653								
Lebensdauer		>10 Mio. Lastwechsel 0 .. 100 % FS						

¹⁾ bei montierter Kupplungsdose entsprechender Schutzart

6.3 Messbereichsgrenzen

Mittels HART Common Practice Commands haben Sie die Möglichkeit folgende Messbereichsgrenzen einzustellen:

Messbereichsgrenzen der Primärvariablen Temperatur:

Untere Messbereichsgrenze		Obere Messbereichsgrenze		Messspanne	
min	max	min	max	min	max
-25°C	75°C	0°C	100°C	25°C	125°C
-13°F	167°F	32°F	212°F	-13°F	257°F

Für Geräte mit Option Druckmessung ETS 4000-P: Messbereichsgrenzen der Sekundärvariablen, Druck:

Untere Messbereichsgrenze		Obere Messbereichsgrenze		Messspanne	
min	max	min	max	min	max
0 % FS	112,5 % FS	37,5 % FS	150 % FS	37,5 % FS	150 % FS

6.4 Protokolldaten

HART Version: 7

Manufacturer Code: 0x605E

Manufacturer String: HYDAC ELECTRONIC

Device Type Code: 0xE2A8 Variante mit Temperatur als PV und einziger Messgröße.

0xE2A9 Variante mit Temperatur als PV und Druck als SV.

7 Typenschlüssel zur Identifikation des gelieferten Gerätes

7.1 Typenschlüssel ETS 4000

ETS 4 X X X - F21 - XXX - E X X - XXX (XXX")

Genauigkeit

1 = 0,4% typ
5 = 1% typ

Anschlussart mechanisch

4 = G 1/4 A ISO 1179-2 (DIN 3852), außen
7 = 9/16-18 UNF 2A (SAE6), außen (nur für Fühlerlänge „010“)
8 = 1/4-18 NPT, außen
(nur für Fühlerlänge „50“, „100“, „250“, „500“)

Elektrischer Anschluss

5 = Gerätestecker, EN 175301-803, 3 pol. + PE
6 = Gerätestecker, M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (Außengewinde), Einzelader
G = 1/2-14 NPT Conduit (Außengewinde), freies Kabelende

Signal

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

Fühlerlänge

010 = 10,4 / 10,7 mm [0,409/ 0,421 Inch] (nur mit SAE6 oder G1/4)
050 = 50 mm [1,97 Inch]
100 = 100 mm [3,937 Inch] (nur mit G1/4 oder 1/4-18 NPT)
250 = 250 mm [9,843 Inch] (nur mit G1/4 oder 1/4-18 NPT)
350 = 350 mm [13,779 Inch] (nur mit G1/4 oder 1/4-18 NPT)

Zulassung

E = ATEX + IECEx

Isolationsspannung

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

Schutzklassen und Einsatzgebiete

	ATEX	IECEx
1 =	I M1 Ex ia I Ma II 1G Ex ia IIC T6,T5 Ga II 1/2 G Ex ia IIC T6,T5 Ga/Gb II 2 G Ex ia IIC T6,T5 Gb II 1D Ex ia IIIC T85°C/T95°C Da	Ex ia I Ma Ex ia IIC T6,T5 Ga Ex ia IIC T6,T5 Ga/Gb Ex ia IIC T6,T5 Gb Ex ia IIIC T85°C/T95°C Da
9 =	II 3G Ex nA IIC T6, T5 Gc nur mit elektrischem Anschluss „6“	Ex nA IIC T6, T5 Gc
A =	II 1D Ex ta IIIC T80/T90°C T ₅₀₀ T90/ T ₅₀₀ T100 Da II 2D Ex tb IIIC T80/T90°C Db	Ex ta IIIC T80/T90°C Da T ₅₀₀ T90/ T ₅₀₀ T100°C Da Ex tb IIIC T80/T90°C Db
	nur mit elektrischem Anschluss „6“	
C =	II 3G Ex ic IIC T6, T5 Gc II 3D Ex ic IIIC T80/T90°C Dc	Ex ic IIC T6, T5 Gc Ex ic IIIC T80/T90°C Dc

Modifikationsnummer

000 = Standard

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

Angaben in m oder “ (inch)

7.2 Typenschlüssel ETS 4000 mit Option Druckmessung

ETS 4 X 2 X - F21 - 007 - P - XXXXX - E X X - XXX (XXX")

Anschlussart mechanisch

2 = G 1/2 A ISO 1179-2 (DIN 3852), Außengewinde

Fühlerlänge

007 = 7 mm [0,276 inch]

Optional mit Druckmessung

Digital mit HART Schnittstelle

Messbereiche

4 stellig für bar-Version

0016; 0040; 0060; 0100; 0250; 0400; 0600

5 stellig für psi-version

00300; 00500; 01000; 03000; 05000; 06000; 09000

8 Seriennummer

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

xyyykzzzzzz

Aufbau Seriennummer:

X	Fertigungsjahr	z. B. : 6 → 2016
yy	Kalenderwoche	z. B.: 23 → KW23
k	Seriennummer-Index	z. B. : -,A,B
zzzzzz	fortlaufende Seriennummer	z. B.: 123456

ETS 4145-F21-250-EN1-000
DEKRA 13ATEX0031X

I M1 Ex ia I Ma	  0158	Range: -25...+100°C
II 1G Ex ia IIC T6,T5 Ga		Signal: 4...20 mA
III 1/2G Ex ia IIC T6,T5 Ga/Gb		1: +Signal/HART
II 1D Ex ia IIIC T85°C Da		2: -Signal
II 2G Ex ia IIC T6,T5 Gb		PE: Housing

IECEx DEK 14.0011X

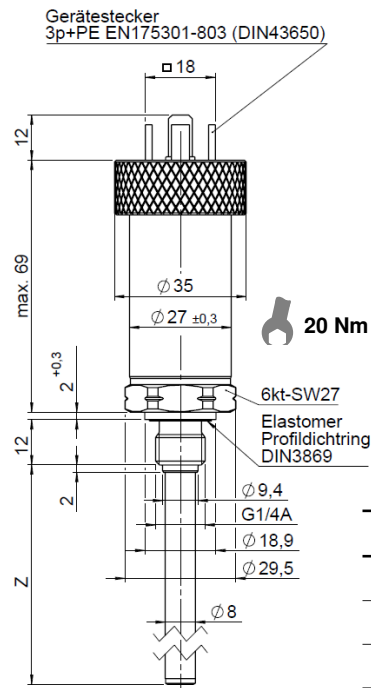
HYDAC ELECTRONIC

MADE IN GERMANY D-66128 SB Hauptstr.27 926000 IP67

S/N: 623A123456



9 Abmessungen



Fühlerlänge (Z)

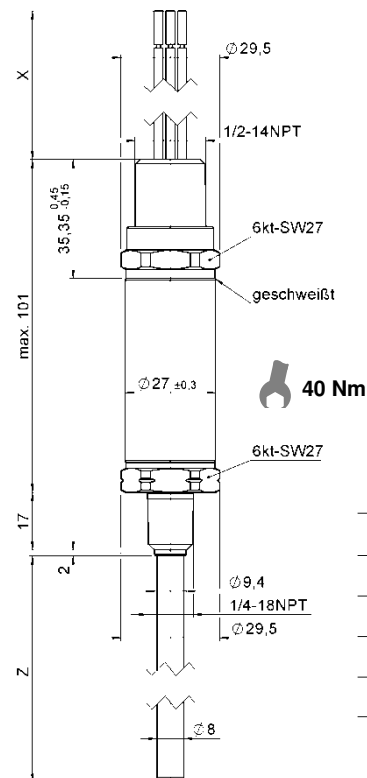
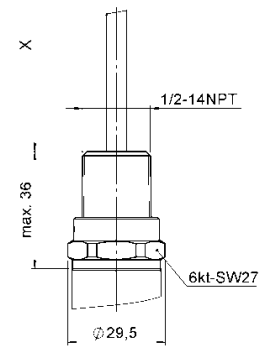
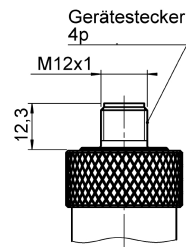
10,7 mm

50 mm

100 mm

250 mm

350 mm



Fühlerlänge (Z)

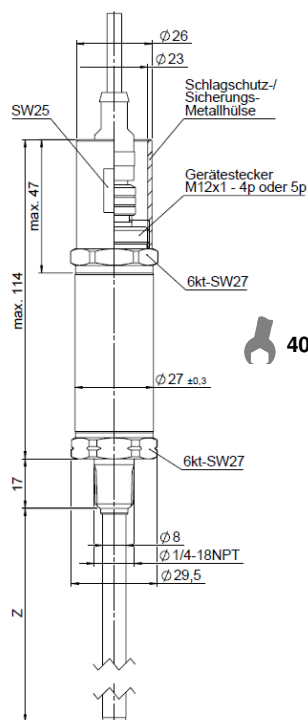
0.42" (10.7 mm)

1.97" (50 mm)

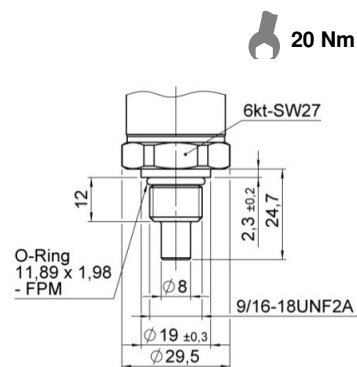
3.94" (100 mm)

9.84" (250 mm)

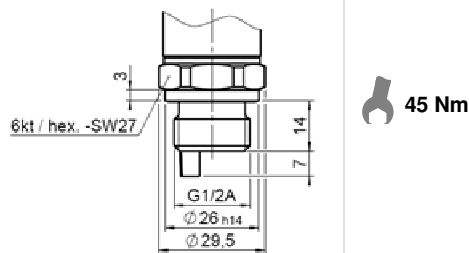
13.8" (350 mm)



40 Nm

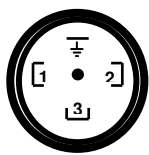


Mechanischer Anschluss mit Option Druckmessung



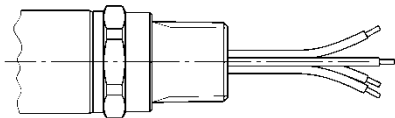
10 Anschlussbelegung

Stecker EN 175301-803



ETS 4xx5-F21:

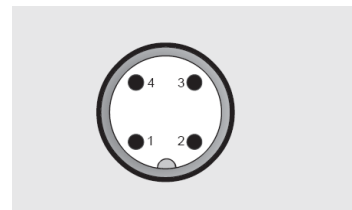
1	Signal+
2	Signal-
3	n.c.
⊥	PE



Conduit (Einzelader)

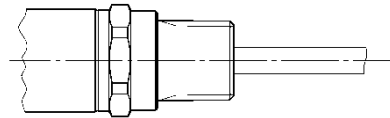
Ader	ETS 45x9-F21
rot	Signal +
schwarz	Signal -
grün-gelb	Gehäuse

Stecker M12x1



ETS 4xx6-F21

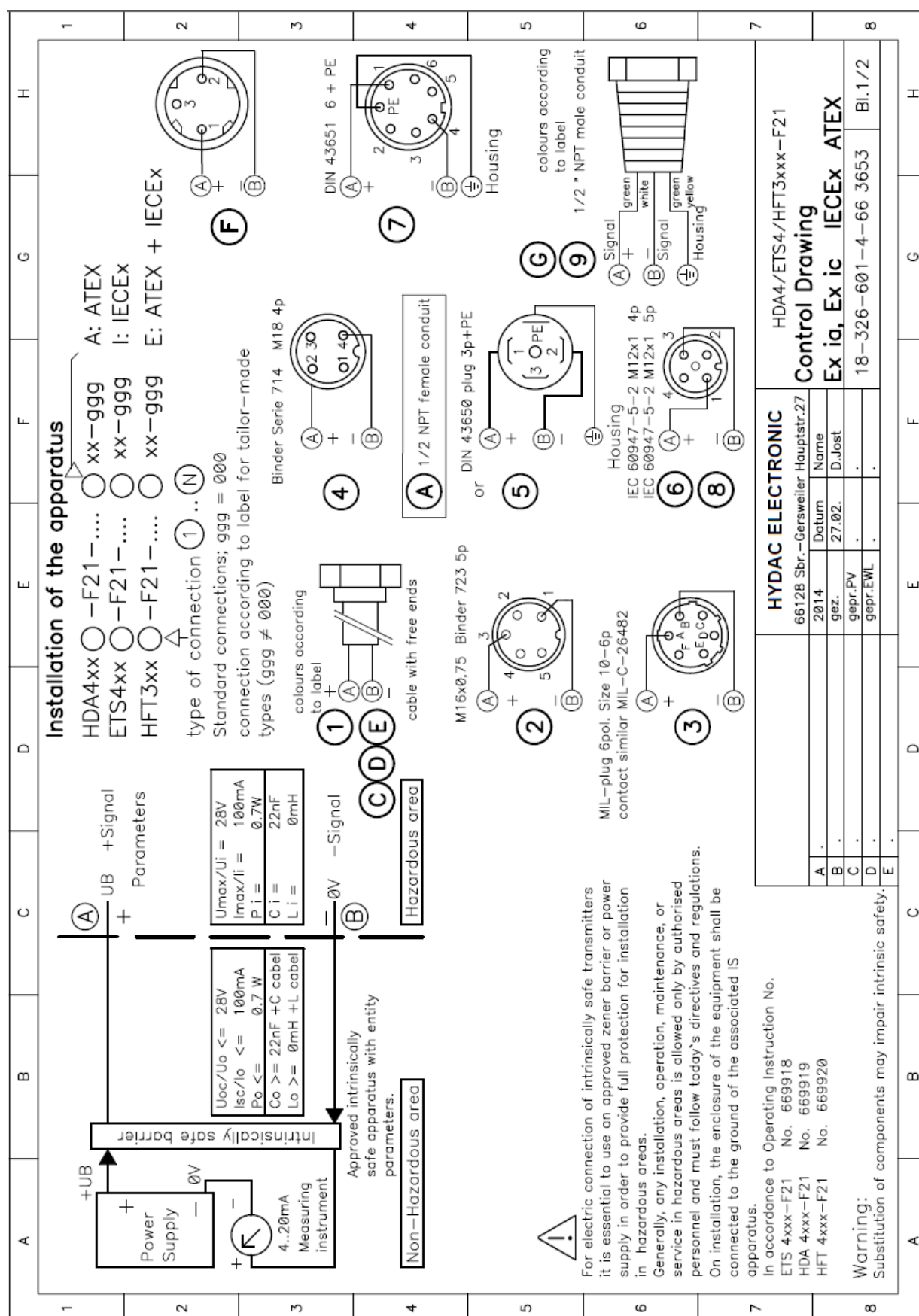
1	Signal+
2	n.c.
3	Signal-
4	n.c.

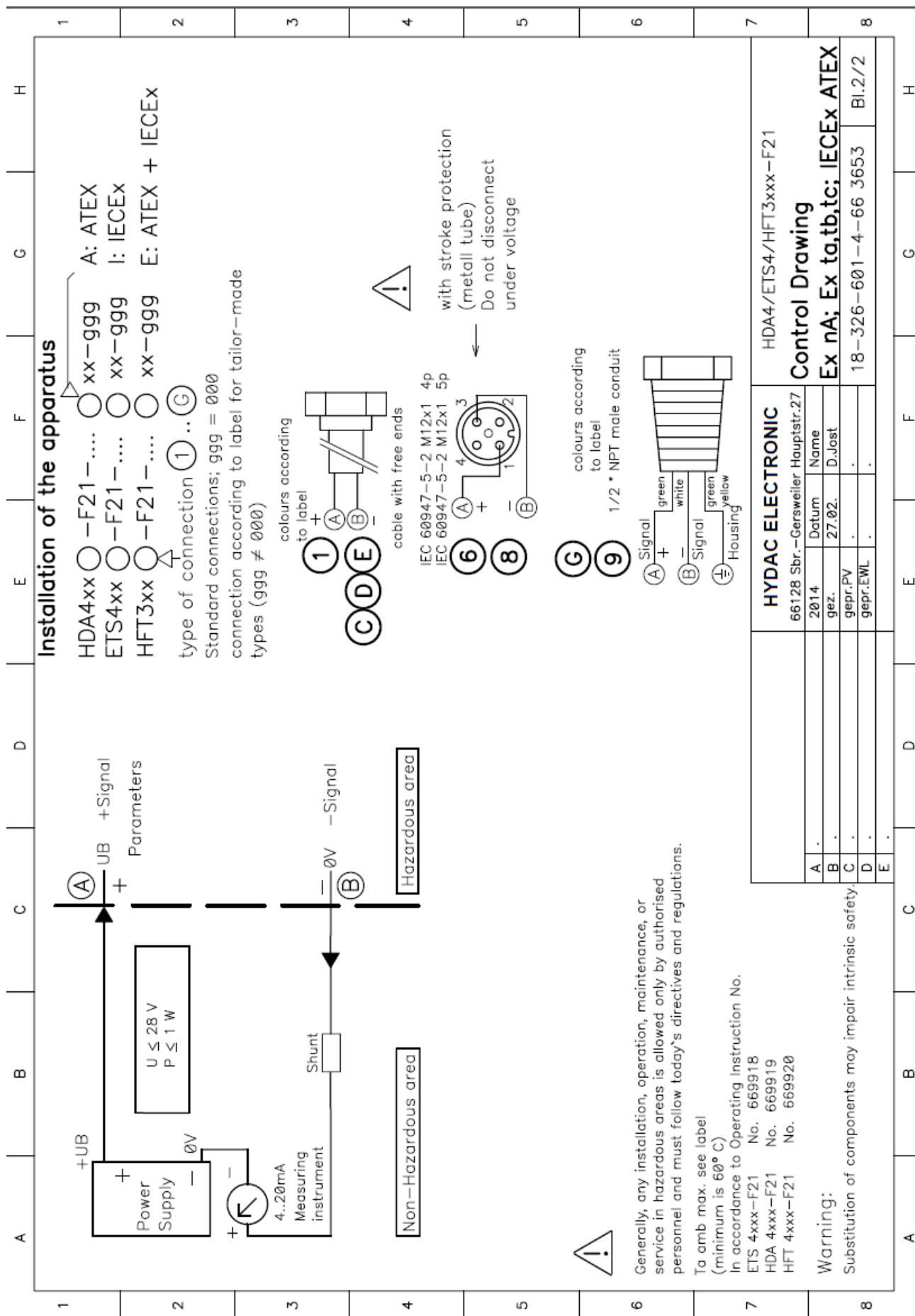


Conduit (Freies Kabelende)

Ader	ETS 45xG-F21
weiß	Signal -
braun	Signal +
grün	n.c.
gelb	n.c.

11 Kontrollzeichnung





12 Zertifikate

12.1 ATEX Zertifikat



CERTIFICATE

(1) EC-Type Examination

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number: DEKRA 13ATEX0031 X Issue Number: 2

(4) Equipment: Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...)

(5) Manufacturer: HYDAC Electronic GmbH

(6) Address: Hauptstraße 27, 66128 Saarbrücken, Germany

(7) This equipment 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 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems 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/DEK/ExTR13.0001/xx.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012
EN 60079-31 : 2009

EN 60079-11 : 2012
EN 50303 : 2000

EN 60079-26 : 2007

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:



IM 1	Ex ia I Ma	or
II 1 G	Ex ia IIC T5, T6 Ga	or
II 1/2 G	Ex ia IIC T5, T6 Ga/Gb	or
II 2 G	Ex ia IIC T5, T6 Gb	or
II 1 D	Ex ta IIIC T80 °C ... T100 °C and T ₅₀₀ 90 °C ... T ₅₀₀ 110 °C Da or	
II 1 D	Ex ia IIIC T85 °C or T95 °C Da or	
II 2 D	Ex tb IIIC T80 °C ... T100 °C Db	

This certificate is issued on 28 March 2014 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

M. Erdhuizen
Certification Manager

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(13) **SCHEDULE**

(14) to EC-Type Examination Certificate DEKRA 13ATEX0031 X

Issue No. 2

(15) **Description**

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...- (...), ETS 4...-F21-(...)-...-...- (...) and HFT 3...-F21-(...)-...-...- (...) are two wire transmitters used to convert a Pressure, Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART).

Optionally, a breathing input for pressure equalisation is available.

The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with EN 60529.

Ambient temperature range:

- apparatus in types of protection Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- apparatus in types of protection Ex ta IIIC and Ex tb IIIC: -40 °C to +80 °C.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature:

Max. ambient temperature	Temperature class (Ex ia/IIIC)	Max. surface temperature "T" (Ex ta/tb/tc IIIC)	Max. surface temperature "T" (Ex ia IIIC)	Max. surface temperature "T ₅₀₀ " (Ex ta IIIC)
60 °C	T6	80 °C	85 °C	90 °C
70 °C	T5	90 °C	95 °C	100 °C
80 °C	--	100 °C		110 °C

Marking

The marking of the Transmitters includes the following codes, depending on the model:

HDA 4...-F21-(...)-...1-(...), ETS 4...-F21-(...)-...1-(...) or HFT 3...-F21-(...)-...1-(...):	I M 1 Ex ia I Ma or II 1 G Ex ia IIC T5, T6 Ga or II 1/2 G Ex ia IIC T5, T6 Ga/Gb or II 2 G Ex ia IIC T5, T6 Gb II 1 D Ex ia IIIC T85 °C or T95 °C Da
HDA 4...-F21-(...)-...2-(...), ETS 4...-F21-(...)-...2-(...) or HFT 3...-F21-(...)-...2-(...):	I M 1 Ex ia I Ma or II 2 G Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-...3-(...), ETS 4...-F21-(...)-...3-(...) or HFT 3...-F21-(...)-...3-(...):	II 2 G Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-...4-(...), ETS 4...-F21-(...)-...4-(...) or HFT 3...-F21-(...)-...4-(...):	II 1 G Ex ia IIC T5, T6 Ga or II 1/2 G Ex ia IIC T5, T6 Ga/Gb or II 2 G Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-...5-(...), ETS 4...-F21-(...)-...5-(...) or HFT 3...-F21-(...)-...5-(...):	I M 1 Ex ia I Ma
HDA 4...-F21-(...)-...A-(...), ETS 4...-F21-(...)-...A-(...) or HFT 3...-F21-(...)-...A-(...):	II 1 D Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da II 2 D Ex tb IIIC T80 °C or T90 °C or T100 °C Db

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Version 5 (2013-07)

(13) **SCHEDULE**

(14) to EC-Type Examination Certificate DEKRA 13ATEX0031 X Issue No. 2

Electrical dataEquipment in type of protection Intrinsic safety "i"

Supply/output circuit.(Connection + and -):
 in type of protection intrinsic safety Ex ia I, Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
 $U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0,7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Equipment in type of protection Equipment dust ignition protection by enclosure "t"

Supply/output circuit.(Connection + and -):
 $U \leq 28 \text{ V}$; $P_{\max} = 1 \text{ W}$.

From a safety point of view, the circuits of the Pressure and/or Temperature and/or Flow Rate Transmitters type ... -F21-(...)-AN-... shall be considered to be connected to earth.

Installation instructions

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

(16) **Test Report**

No. NL/DEK/ExTR13.0001/xx.

(17) **Specific conditions of use**

1. Transmitters with an enclosure containing light metals, when used in a potentially explosive atmosphere requiring apparatus of equipment category 1 G or M 1, shall be installed such, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.
2. For installation of the transmitter between areas where the use of category 1 apparatus is required and areas where the use of category 2 apparatus is required, the following applies:
 The internal separation element shall be protected against environmental stress, which might adversely affect the separation element. The material of the separation element shall be obtained from the data supplied by the manufacturer.
3. The transmitter may alternatively be used with separately supplied certified cable entries or conduit entries that are rated for the intended application.

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

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. NL/DEK/ExTR13.0001/xx.

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 Version 5 (2013-07)



CERTIFICATE

(1) Type Examination

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) Type Examination Certificate Number: DEKRA 13ATEX0032 Issue Number: 2

(4) Equipment: Pressure and/or Temperature and/or Flow Rate Transmitters
Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...)
and HFT 3...-F21-(...)-...-(...)

(5) Manufacturer: HYDAC Electronic GmbH

(6) Address: Hauptstraße 27, 66128 Saarbrücken, Germany

(7) This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems 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 no. NL/DEK/ExTR13.0001/xx.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012
EN 60079-31 : 2009

EN 60079-11 : 2012

EN 60079-15 : 2010

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This Type Examination Certificate relates only to the design, examination and tests of the specified equipment and not to the manufacturing process and supply of this equipment.

(12) The marking of the equipment shall include the following:



II 3 G Ex nA IIC T4 ... T6 Gc or Ex ic IIC T4 ... T6 Gc
II 3 D Ex tc IIIC T80 °C ... T100 °C Dc or Ex ic IIIC T80 °C ... T100 °C Dc

This certificate is issued on 28 March 2014 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

M. Erdhuizen
Certification Manager

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(13) **SCHEDULE**

(14) to Type Examination Certificate DEKRA 13ATEX0032

Issue No. 2

(15) **Description**

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...- (...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a pressure signal into a 4 - 20 mA analogue output signal. Optionally, a breathing input for pressure equalisation is available.

Ambient temperature range -40 °C to +80 °C. (Category 3 D)

Ambient temperature range -40 °C to +85 °C. (Category 3 G)

The enclosure provides a degree of protection of at least IP64 in accordance with EN 60529.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature:

Max. ambient temperature	Temperature class	Max. surface temperature "T"
60 °C	T6	80 °C
70 °C	T5	90 °C
80 °C	—	100 °C
85 °C	T4	—

Marking

The marking of the Pressure Transmitter includes the following codes, depending on the model:

HDA 4...-F21-(...)-...9-(...), ETS 4...-F21-(...)-...9-(...) or HFT 3...-F21-(...)-...9-(...):	II 3 G Ex nA IIC T6, T5, T4 Gc
HDA 4...-F21-(...)-...B-(...), ETS 4...-F21-(...)-...B-(...) or HFT 3...-F21-(...)-...B-(...):	II 3 D Ex tc IIIC T80 °C/T90 °C/T100 °C Dc IP6X
HDA 4...-F21-(...)-...C-(...), ETS 4...-F21-(...)-...C-(...) or HFT 3...-F21-(...)-...C-(...):	II 3 G Ex ic IIC T6, T5, T4 Gc II 3 D Ex ic IIIC T80 °C/T90 °C/T100 °C Dc IP6X

Electrical dataApparatus in type of protection intrinsic safety "i"

Supply/output circuit (connections + and -):

in type of protection intrinsic safety Ex ic IIC, only for connection to an energy limited or intrinsically safe circuit, with the following maximum values:

$U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0,7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Apparatus in types of protection Ex nA and Ex tc

Supply/output circuit (Connection + and -):

$U \leq 28 \text{ V}$; $P_{\max} = 1 \text{ W}$.

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Version 5 (2013-07)



(13) **SCHEDULE**

(14) to Type Examination Certificate DEKRA 13ATEX0032

Issue No. 2

Installation instructions

The manual provided with the equipment shall be followed in detail to assure safe operation.

(16) **Test Report**

No. NL/DEK/ExTR13.0001/xx.

(17) **Special conditions for safe use**

None.

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

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. NL/DEK/ExTR13.0001/xx.

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Version 5 (2013-07)

12.2 IECEx Zertifikat

 IECEx Certificate of Conformity	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres for rules and details of the IECEx Scheme visit www.iecex.com	
Certificate No.:	IECEx DEK 14.0011X issue No.:0 Certificate history:
Status:	Current
Date of Issue:	2014-03-28 Page 1 of 3
Applicant:	HYDAC Electronic GmbH Hauptstrasse 27 66128 Saarbrücken Germany
Electrical Apparatus:	Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...F21- (...)-...-(...), ETS 4...F21-(...)-...-(...) and HFT 3...F21-(...)-...-(...)
Optional accessory:	
Type of Protection:	Ex ia, Ex ic, Ex nA, Ex ta, Ex tb, Ex tc
Marking:	Ex ia I Ma Ex ia IIC T5, T6 Ga Ex ia IIC T5, T6 Ga/Gb Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da Ex tb IIIC T80 °C or T90 °C or T100 °C Db Ex nA IIC T6, T5, T4 Gc Ex tc IIIC T80 °C/T90 °C/T100 °C Dc Ex ic IIC T6, T5, T4 Gc Ex ic IIIC T80 °C/T90 °C/T100 °C Dc
Approved for issue on behalf of the IECEx Certification Body:	M. Erdhuizen
Position:	Certification Manager
Signature: (for printed version)	
Date:	<u>2014-03-28</u>
1. This certificate and schedule may only be reproduced in full. 2. This certificate is not transferable and remains the property of the issuing body. 3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website .	
Certificate issued by: DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem The Netherlands 	



IECEx Certificate of Conformity

Certificate No.: IECEx DEK 14.0011X

Date of Issue: 2014-03-28

Issue No.: 0

Page 2 of 3

Manufacturer: **HYDAC Electronic GmbH**
Hauptstrasse 27
66128 Saarbrücken
Germany

Additional Manufacturing location
(s):

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

STANDARDS:

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

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

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

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
[NL/DEK/ExTR13.0001/01](#)

Quality Assessment Report:
[DE/BVS/QAR06.0017/05](#)



IECEx Certificate of Conformity

Certificate No.: IECEx DEK 14.0011X

Date of Issue: 2014-03-28

Issue No.: 0

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Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a Pressure and/or Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART). Optionally, a breathing input for pressure equalisation is available. The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with IEC 60529.

Ambient temperature range, depending on type of protection:

- Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- Ex ic IIC and Ex nA IIC: -40 °C to +85 °C;
- Ex ta IIIC, Ex tb IIIC, Ex tc IIIC and Ex ic IIIC: -40 °C to +80 °C.

For more detailed information see annex.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. Transmitters with an enclosure containing light metals, when used in a potentially explosive atmosphere requiring apparatus of equipment protection level Ga or Ma, shall be installed such, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.
2. For installation of the Transmitter between areas where the use of equipment protection level Ga is required and areas where the use of equipment protection level Gb is required, the following applies:
The internal separation element shall be protected against environmental stress, which might adversely affect the separation element. The material of the separation element shall be obtained from the data supplied by the manufacturer.
3. The pressure transmitter may alternatively be used with separately supplied certified cable entries or conduit entries that are rated for the intended application.

Annex: 215811500-14.0011.00-Annex to CoC.pdf



Annex 1 to Certificate of Conformity IECEx DEK 14.0011, Issue 0

Description

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a Pressure and/or Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART). Optionally, a breathing input for pressure equalisation is available.

The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with IEC 60529.

Thermal data

Ambient temperature range, depending on type of protection:

- Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- Ex ic IIC and Ex nA IIC: -40 °C to +85 °C;
- Ex ta IIIC, Ex tb IIIC, Ex tc IIIC and Ex lc IIIC: -40 °C to +80 °C.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature, as listed in following table:

Max. ambient temperature	Temperature class (Ex nA IIC, Ex ia/ic IIC)	Max. surface temperature "T" (Ex ta/tb/tc IIIC, Ex lc IIIC)	Max. surface temperature "T" (Ex ia IIC)	Max. surface temperature "T ₅₀₀ " (Ex ta IIIC)
60 °C	T6	80 °C	85 °C	90 °C
70 °C	T5	90 °C	95 °C	100 °C
80 °C	--	100 °C		110 °C
85 °C	T4	--	--	--

Electrical data

Equipment in type of protection Intrinsic safety "I"

Supply/output circuit.(Connection + and -):

in type of protection intrinsic safety Ex ia I, Ex ia IIC, Ex ia IIIC, Ex ic IIC and Ex ic IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0.7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Equipment in type of protection Equipment dust ignition protection by enclosure "I" and type "n" (non-sparking nA)

Supply/output circuit.(Connection + and -):

$U \leq 28 \text{ V}$; $P_{\max} = 1 \text{ W}$.

From a safety point of view, the circuits of the transmitters type ... -F21-(...)-N-... shall be considered to be connected to earth.

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Version 2 (2013-07)

DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
T +31 88 9683000 F +31 88 9683100 www.dekra-certification.com Registered Arnhem 09085396



Annex 1 to Certificate of Conformity IECEx DEK 14.0011, issue 0

Marking

The marking of the Transmitters includes the following codes, depending on the model:

HDA 4...-F21-(...)-.1-(...), ETS 4...-F21-(...)-.1-(...) or HFT 3...-F21-(...)-.1-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da
HDA 4...-F21-(...)-.2-(...), ETS 4...-F21-(...)-.2-(...) or HFT 3...-F21-(...)-.2-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-.3-(...), ETS 4...-F21-(...)-.3-(...) or HFT 3...-F21-(...)-.3-(...):	Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-.4-(...), ETS 4...-F21-(...)-.4-(...) or HFT 3...-F21-(...)-.4-(...):	Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da
HDA 4...-F21-(...)-.5-(...), ETS 4...-F21-(...)-.5-(...) or HFT 3...-F21-(...)-.5-(...):	Ex ia I Ma
HDA 4...-F21-(...)-.A-(...), ETS 4...-F21-(...)-.A-(...) or HFT 3...-F21-(...)-.A-(...):	Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da Ex tb IIIC T80 °C or T90 °C or T100 °C Db
HDA 4...-F21-(...)-.9-(...), ETS 4...-F21-(...)-.9-(...) or HFT 3...-F21-(...)-.9-(...):	Ex nA IIC T6, T5, T4 Gc
HDA 4...-F21-(...)-.B-(...), ETS 4...-F21-(...)-.B-(...) or HFT 3...-F21-(...)-.B-(...):	Ex tc IIIC T80 °C/T90 °C/T100 °C Dc
HDA 4...-F21-(...)-.C-(...), ETS 4...-F21-(...)-.C-(...) or HFT 3...-F21-(...)-.C-(...):	Ex ic IIC T6, T5, T4 Gc Ex ic IIIC T80 °C/T90 °C/T100 °C Dc



Annex 1 to Certificate of Conformity IECEx DEK 14.0011, issue 0

Description

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a Pressure and/or Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART). Optionally, a breathing input for pressure equalisation is available. The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with IEC 60529.

Thermal data

Ambient temperature range, depending on type of protection:

- Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- Ex ic IIC and Ex nA IIC: -40 °C to +85 °C;
- Ex ta IIIC, Ex tb IIIC, Ex tc IIIC and Ex ic IIIC: -40 °C to +80 °C.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature, as listed in following table:

Max. ambient temperature	Temperature class (Ex nA IIC, Ex ia/ic IIC)	Max. surface temperature "T" (Ex ta/tb/tc IIIC, Ex ic IIIC)	Max. surface temperature "T" (Ex ia IIIC)	Max. surface temperature "T ₅₀₀ " (Ex ta IIIC)
60 °C	T6	80 °C	85 °C	90 °C
70 °C	T5	90 °C	95 °C	100 °C
80 °C	--	100 °C		110 °C
85 °C	T4	--	--	--

Electrical data

Equipment in type of protection Intrinsic safety "I"

Supply/output circuit.(Connection + and -):

in type of protection intrinsic safety Ex ia I, Ex ia IIC, Ex ia IIIC, Ex ic IIC and Ex ic IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0.7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Equipment in type of protection Equipment dust ignition protection by enclosure "t" and type "n" (non-sparking nA)

Supply/output circuit.(Connection + and -):

$U \leq 28 \text{ V}$; $P_{\text{max}} = 1 \text{ W}$.

From a safety point of view, the circuits of the transmitters type ... -F21-(...)-N-... shall be considered to be connected to earth.

Page 1 of 2

Form 124
Version 2 (2013-07)

DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
T +31 88 9683000 F +31 88 9683100 www.dekra-certification.com Registered Arnhem 09085396



Annex 1 to Certificate of Conformity IECEx DEK 14.0011, issue 0

Marking

The marking of the Transmitters includes the following codes, depending on the model:

HDA 4...-F21-(...)-..1-(...), ETS 4...-F21-(...)-..1-(...) or HFT 3...-F21-(...)-..1-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da	
HDA 4...-F21-(...)-..2-(...), ETS 4...-F21-(...)-..2-(...) or HFT 3...-F21-(...)-..2-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Gb	
HDA 4...-F21-(...)-..3-(...), ETS 4...-F21-(...)-..3-(...) or HFT 3...-F21-(...)-..3-(...):	Ex ia IIC T5, T6 Gb	
HDA 4...-F21-(...)-..4-(...), ETS 4...-F21-(...)-..4-(...) or HFT 3...-F21-(...)-..4-(...):	Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da	
HDA 4...-F21-(...)-..5-(...), ETS 4...-F21-(...)-..5-(...) or HFT 3...-F21-(...)-..5-(...):	Ex ia I Ma	
HDA 4...-F21-(...)-..A-(...), ETS 4...-F21-(...)-..A-(...) or HFT 3...-F21-(...)-..A-(...):	Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da Ex tb IIIC T80 °C or T90 °C or T100 °C Db	
HDA 4...-F21-(...)-..9-(...), ETS 4...-F21-(...)-..9-(...) or HFT 3...-F21-(...)-..9-(...):	Ex nA IIC T6, T5, T4 Gc	
HDA 4...-F21-(...)-..B-(...), ETS 4...-F21-(...)-..B-(...) or HFT 3...-F21-(...)-..B-(...):	Ex tc IIIC T80 °C/T90 °C/T100 °C Dc	
HDA 4...-F21-(...)-..C-(...), ETS 4...-F21-(...)-..C-(...) or HFT 3...-F21-(...)-..C-(...):	Ex ic IIC T6, T5, T4 Gc Ex ic IIIC T80 °C/T90 °C/T100 °C Dc	

13 Konformitätserklärung

Datum
Ihr Zeichen
Ihre Nachricht
Unser Zeichen



Telefon direkt
Telefax direkt
E-Mail

Betreff

HYDAC ELECTRONIC GMBH, Hauptstraße 27, 66128 Saarbrücken

HYDAC ELECTRONIC GMBH

Hauptstraße 27
66128 Saarbrücken, Deutschland

Telefon Zentrale 06897 509-01
Fax Einkauf 06897 509-1745
Fax Verkauf 06897 509-1735

Internet: www.hydac.com
siehe dort auch: Allgemeine Geschäftsbedingungen (AGB)

EU-Konformitätserklärung / EC declaration of conformity 18 / 121- / 15

Hiermit erklären wir, 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 Normen entspricht.

Bei einer nicht mit uns schriftlich abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit.

We herewith declare 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.

This declaration ceases to be valid if the product is modified without our written consent.

Bezeichnung / Designation	Tempertur Messumformer / Temperatur Transducer
Typ	ETS 4xxx-F21-xxx-(P-xxxx)-A/Exxx....
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-1 Ok1 07/ -2-März06/ - 3 / 4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	94/9 EG
Normen	EN 60079-0: 2012 ; -11: 2012 ; -26 2007 EN 60079-31: 2009 ; EN 50303: 2000
EG Baumusterprüfbescheinigung / EC -Type Examination Certificate :	KEMA 13 ATEX 0031X Issue: 2
DEKRA Certification B.V Utrechtseweg 310; NL 6812 AR Arnheim	
Prüfstelle / notified body :	DEKRA EXAM Nr. : no: 0158

Schutzartkennzeichen / Code for Type protection :

I M1 Exia I Ma ; II 1G Ex ia IIC T5, T6 Ga; II 1/2G Ex ia IIC T5, T6 Ga/Gb;
II 2G Ex ia IIC T5, T6 Gb
II 1D Ex ta IIIC T80...100°C and T₅₀₀ 90...110°C Da ; II 1D Ex ia IIIC T85°C or 95°C Da ;
II 2D Ex tb IIIC T80...100°C Db

04.05.2015

J. Morsch

Datum / Date

Name /

(CE-Bekräftiger) / (CE-authorized person)

630108

Geschäftsführer:
Matthias Dietel
Dr. Franz Josef Eckle

Sitz der Gesellschaft:
66128 Saarbrücken

Registriergericht:
Saarbrücken, HRB 8707

USt-Identnummer: DE 138 277 443

Steuernummer: 040/11050684

Bankverbindungen in Saarbrücken:

Commerzbank AG
Nr. 310808000, BLZ 590 800 00
BIC: COMDE333
IBAN: DE 77 5908 0090 0316 8888 00
Hypo Vereinsbank
Nr. 353560204, BLZ 590 200 90
BIC: HYVE DE 33
IBAN: DE 58 5902 0090 0353 5682 84

SaarLB

Nr. 5250006, BLZ 590 500 00
BIC: SALA DE 33
IBAN: DE 51 5905 0000 0005 2500 06

Deutsche Bank AG
Nr. 035500000, BLZ 590 700 00
BIC: DEUT DE 33
IBAN: DE 54 5907 0000 0035 5800 00

HYDAC ELECTRONIC

HYDAC ELECTRONIC GMBH, Hauptstraße 27, 66128 Saarbrücken

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66128 Saarbrücken, DeutschlandTelefon Zentrale 06897 509-01
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siehe dort auch: Allgemeine Geschäftsbedingungen (AGB)Datum
Ihr Zeichen
Ihre Nachricht
Unser ZeichenTelefon direkt
Telefax direkt
E-Mail

Betreff

EU-Konformitätserklärung / EC declaration of conformity 18 / 122- / 15

Hiermit erklären wir, 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 Normen entspricht.

Bei einer nicht mit uns schriftlich abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit.

We herewith declare 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.

This declaration ceases to be valid if the product is modified without our written consent.

Bezeichnung / Designation	Druckmessumformer / Pressure Transducer
Typ	ETS 4xxx-F21-xxx-(P-xxxx)-A/Exx...
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-1 Okt 07/ -2-März06/ - 3 /4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	94/9 EG
Normen	EN 60079-0: 2012 ; -11: 2012 ; -15: 2010 EN 60079-31: 2009
EG Baumusterprüfbescheinigung / EC -Type Examination Certificate :	DEKRA 13 ATEX 0032 Issue: 2
DEKRA Certification B.V Utrechtseweg 310; NL 6812 AR Arnhem	
Prüfstelle / notified body :	DEKRA EXAM Nr. : no: 0158

Schutzartkennzeichen / Code for Type protection :

II 3G Ex nA IIC T4..T6 Gc or Ex ic IIC T4..T6 Gc
II 3D Ex tc IIIC T80..100°C Dc or Ex ic IIIC T80..100°C Dc

04.05.2015

J. Morsch

Datum / Date

Name /

(CE-Beauftragter) / (CE-authorized person)

Geschäftsführer:
Mathias Dieter
Dr. Franz Josef EickelSitz der Gesellschaft:
66128 Saarbrücken
Registergericht:
Saarbrücken, HRB 8707
USt-Identnummer: DE 138 277 443
Steuernummer: 040/110/50694Bankverbindungen in Saarbrücken:
Commerzbank AG
Nr. 31688800, BLZ 500 600 00
BIC: COMDE33HAN
IBAN: DE 77 5900 0090 0316 8888 00
Mypo Vereinsbank
Nr. 353568284, BLZ 500 200 00
BIC: HYVEDE33HAN
IBAN: DE 58 5902 0090 0353 5682 64SaarlB
Nr. 5250006, BLZ 500 500 00
BIC: SALA DE 55 XXXX
IBAN: DE51 5905 0000 0005 2500 08
Deutsche Bank AG
Nr. 035500000, BLZ 500 700 00
BIC: DEUT DE 33 XXXX
IBAN: DE 54 5007 0000 0035 5000 00

630408

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

HYDAC SERVICE GMBH
Hauptstr. 27
D - 66 128 Saarbrücken
Deutschland

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

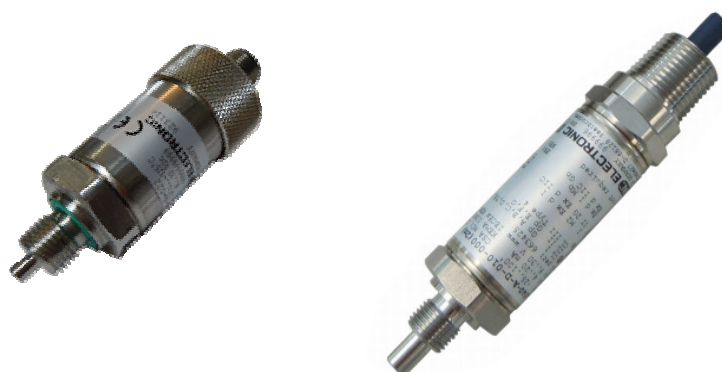
Anmerkung

Die Angaben in diesem Handbuch beziehen sich auf die beschriebenen Betriebsbedingungen und Einsatzfälle. For applications or operating conditions not described, please contact the relevant technical department.

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

Technische Änderungen sind vorbehalten.

Operating Instructions Temperature Transmitter Series ETS 4000 with HART interface for intrinsically safe circuits and protection by enclosure with **ATEX** and **IECEx** approval (Translation of the original operating instructions)



Protection Types and Zones:

ATEX		
13ATEX0031X	I M1	Ex ia I Ma
	II 1G	Ex ia IIC T6,T5 Ga
	II 1/2 G	Ex ia IIC T6,T5 Ga/Gb
	II 2 G	EX ia IIC T6,T5 Gb
	II 1D	Ex ia IIIC T85°C or T95°C Da
	II 1D	Ex ta IIIC T80/90/100°C T ₅₀₀ T90/T100/T110°C Da
13ATEX0032	II 2D	Ex tb IIIC T80/90/100°C Db
	II 3G	Ex nA IIC T6, T5, T4 Gc
	II 3G	Ex ic IIC T6, T5, T4 Gc
	II 3D	Ex tc IIIC T80/T90/T100°C Dc
	II 3D	Ex ic IIIC T80/T90/T100°C Dc
IECEx		
IECEx DEK 14.0011X	Ex ia I Ma	
	Ex ia IIC T6,T5 Ga	
	Ex ia IIC T6,T5 Ga/Gb	
	Ex ia IIC T6,T5 Gb	
	Ex ia IIIC T85°C or T95°C Da	
	Ex ta IIIC T80/90/100 °C Da T ₅₀₀ 90/100/110 °C Da	
	Ex tb IIIC T80/90/100 °C Db	
	Ex nA IIC T6/ T5 T4 Gc	
	Ex ic IIC T6/ T5/T4 Gc	
	Ex tc IIIC T80/90/100 °C Dc	
	Ex ic IIIC T80/90/100 °C Dc	

ATEX certificate: DEKRA 13ATEX0031 X

DEKRA 13ATEX0032

IECEx Certificate: IECEx DEK 14.0011X

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1 General

If you have any queries regarding technical details or the suitability of the unit for your application, please contact our **Technical Sales Department**. The ETS 4000 temperature 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 and IECEx approvals to become null and void.

2 Function

The temperature signal measured by the sensor is converted into an analog 4 .. 20 mA Signal. In addition with the analogue output of the measured value, digital communication is possible by means of the HART protocol. Connection to the power supply is carried out via a plug connector or a permanently connected line.

3 Installation and Commissioning Information

The temperature transmitters can be installed directly on the process side via the threaded connection. The temperature sensor is built into the stem before the thread. In order to perform correct measurements, ensure the stem is immersed in the flow of the fluid.

Tightening torque see dimensions.

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 temperature transmitters of the ETS 4000 series are **CE**-marked. The certificate of conformity is to be found in the annex.

The requirements of the standards (see technical data) cannot be satisfied unless the temperature transmitter housing is properly grounded via the mechanical connection or the 1/2 NPT Conduit. If a green-yellow wire is available, it can be used additionally for grounding, but may not be used on its own as the grounding connection.

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

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

For temperature transmitters with optional pressure measurement

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

On devices with a rated pressure of ≤ 100 bar (≤ 1500 psi) and a 1/2 NPT Conduit, this bore is located at the 1/2 NPT Conduit.

The General Safety Precautions (cf. section 5) must be adhered to in any event.

Installation per Control Drawings No. 663653 (see chapter 12).

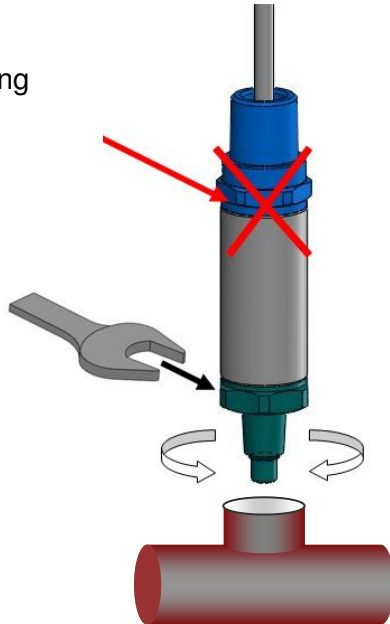
4 Important Mounting Instructions for Conduit Connection

4.1 Installation Instructions for Units with 1/2 " NPT Conduit

Mechanical Connection

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

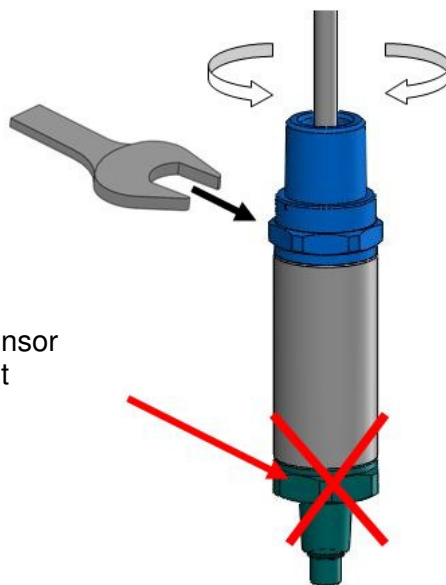
Do not use for screwing into the mechanical connection!



Electrical Installation

The flat at the electrical connection side next to the 1/2 NPT Conduit only serves to fix the temperature transmitter during conduit installation.

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



4.2 Installation Instructions for units with impact protection

Installation instructions for units with M12x1 connector with an impact protected metal safety sleeve for the use in zones:

ATEX

II 3G Ex nA IIC T6,T5 Gc

II 1D Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da

II 2D Ex tb III C T80/T90°C Db

IECEx

Ex nA IIC T6,T5 Gc

Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da

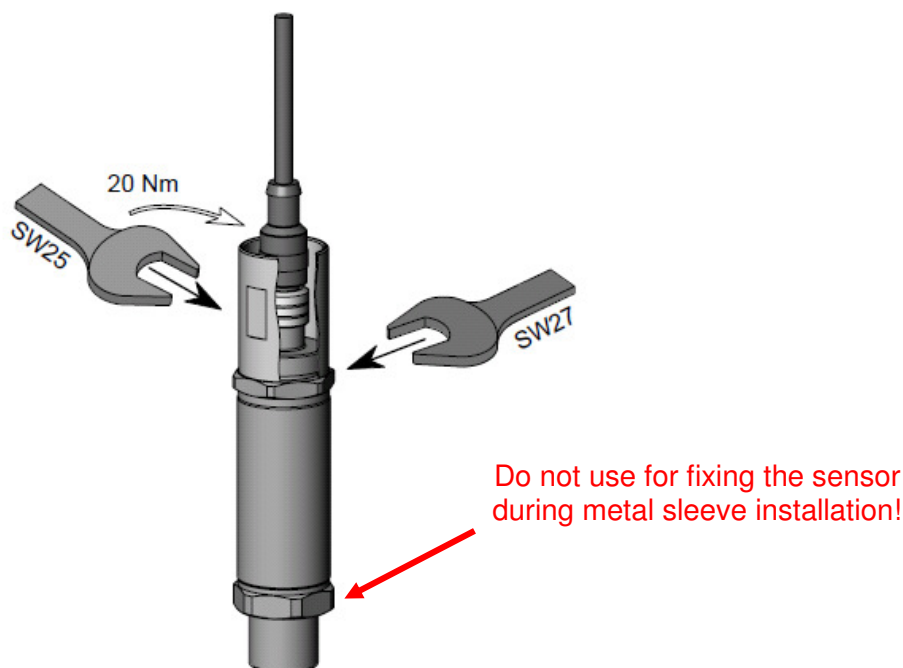
Ex tb III C T80/T90°C Db

By adherence to safety guidelines in the protection rating and applications, the usage of the impact protected metal safety sleeve is stringently required.

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

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

The connection of the cable with M12x1 plug may only be carried out in de-energized state and in combination with the impact protected metal safety sleeve. Also the separation of the M12x1 connector may only be carried out if the system is switched off.





5 General safety precautions

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

Intrinsic safety barriers with protection type „ia“ are to be used for connecting to the temperature transmitters.

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

Ensure that the measured fluids are compatible with materials of the seals and the materials of the temperature transmitter used. Similarly, the "Safety-relevant Data" specified in the certificate must be adhered to.

For temperature transmitters with optional pressure measurement function

If used simultaneously in zones 0 and 1, the pressure membrane of the device serves as a partition wall between zones 0 and 1. The thickness of this partition wall is generally $\leq 1\text{mm}$, and with a nominal pressure ranging below 100 bar, $\leq 0.2\text{ mm}$. In order to ensure this partition function, the compatibility of the measuring fluids with the used device materials is compulsory, as well as the overload and bursting pressures must absolutely be complied with (further details, please see "Technical Data").

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

Please ensure sufficient sealing between the zones as well.

The data pertaining to use in Hazardous Location is to be heeded in any event.

Operation is only permitted if operational and process-related intensive electrostatic charges have been eliminated.

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

By adherence to safety guidelines in the protection rating and applications:

ATEX: II 3G Ex nA IIC T6,T5 Gc / II 1D Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da /
II 2D Ex tb III C T80/T90°C Db

IECEx: Ex nA IIC T6,T5 Gc / Ex ta IIIC T80/T90°C T₅₀₀T90/ T₅₀₀T100 Da /
Ex tb III C T80/T90°C Db

the usage of the impact protected metal safety sleeve is compulsory

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

6 Technical Data

6.1 ETS 4000 Standard without pressure measurement

Input data	ETS 4100	ETS 4500
Measuring element	Silicon semiconductor	
Measuring range	-25 .. +100 °C [-13 .. +212 °F]	
Probe length	10.4 (SAE6); 10.7 (G1/4); 50; 100; 250; 350 mm	
Pressure resistance	600 bar [8700 psi] probe length 10.4/ 10.7 mm [0.409/ 0.421 Inch] 125 bar [1800 psi] probe length 50 mm [1.97 Inch] 125 bar [1800 psi] probe length 100 mm [3.937 Inch] 125 bar [1800 psi] probe length 250 mm [9.843 Inch] 125 bar [1800 psi] probe length 350 mm [13.779 Inch]	
Mechanical connection	G1/4 A ISO 1179-2 (DIN 3852) 9/16-18 UNF 2A (SAE6) 1/4-18 NPT	
Torque value	see dimensions	
Parts in contact with fluid	1.4571(316Ti); 1.4301 (304) Seal: FPM (SAE6 and G1/4)	
Conduit / Housing material	1.4404 (316L)	
Output data		
Output signal	4 .. 20 mA with HART protocol	
HART Communication	According to HART 7 specifications	
HART Common Practice Commands i.e.	Altering of measuring range limits (see table)	
Permitted resistance	$R_{Lmax} = (U_B - 12 \text{ V}) / 20 \text{ mA [k}\Omega\text{]}$ with HART communication min. 250Ω	
Accuracy (at room temperature)	$\leq \pm 0.4 \% \text{ FS typ.}$ $\leq \pm 0.8 \% \text{ FS max.}$	$\leq \pm 1.0 \% \text{ FS typ.}$ $\leq \pm 2.0 \% \text{ FS max.}$
Temperature drift	$\leq \pm 0.01 \% \text{ FS/}^\circ\text{C [0.006 \% FS/}^\circ\text{F]}$	$\leq \pm 0.02 \% \text{ FS/}^\circ\text{C [0.01 \% FS/}^\circ\text{F]}$
Rise time to DIN EN 60751	$t_{50}: \sim 10 \text{ s}$ $t_{90}: \sim 15 \text{ s}$	
Ambient conditions		
Operating/ Ambient temperature range ¹⁾²⁾	T6,T80,T85°C,T ₅₀₀ 90 Ta=-40..+60°C/-20 .. +60°C[-40 .. +140°F/-4 .. +140 °F] T5,T90,T95°C,T ₅₀₀ 100 Ta=-40..+70°C/-20 .. +70 °C[-40 .. +158°F/-4 .. +158 °F] T100,T ₅₀₀ 110 Ta=-40..+80°C/-20 .. +80 °C[-40 .. +176°F/-4 .. +176 °F] T4 Ta=-40..+85°C/-20 .. +85 °C[-40 .. +185°F/-4 .. +185 °F]	
Fluid temperature range ¹⁾²⁾	T6,T80,T85°C,T ₅₀₀ 90 Ta=-40..+60°C/-20 .. +60°C[-40 .. +140°F/-4 .. +140 °F] T5,T90,T95°C,T ₅₀₀ 100 Ta=-40..+70°C/-20 .. +70 °C[-40 .. +158°F/-4 .. +158 °F] T100,T ₅₀₀ 110 Ta=-40..+80°C/-20 .. +80 °C[-40 .. +176°F/-4 .. +176 °F] T4 Ta=-40..+85°C/-20 .. +85 °C[-40 .. +185°F/-4 .. +185 °F]	
Storage temperature range	-40 .. +100 °C [-40 .. +212 °F]	
CE - mark	EN 61000-6-1 / 2 / 3 / 4 EN 60079-0/ 11/ 15/ 26/ 31	
Vibration resistance to IEC 60068-2-6 at 10..500Hz	$\leq 20 \text{ g}$ $\leq 10 \text{ g (with 1/2 NPT Conduit)}$	
Protection class to IEC 60529 ³⁾ ISO 20653	IP 67 (connector M12x1, EN175301-803) IP 6K9K (with 1/2 NPT Conduit)	
Relevant data for Ex applications	Ex ia, ic	Ex nA, ta, tb, tc
Supply voltage	12...28 VDC	12...28 VDC
Max. input current	Ii = 100 mA	
Maximum input power	Pi = 0.7 W	Max. power consumption ≤ 1 W
Connection capacitance of the sensor	Ci ≤ 22 nF	
Inductivity of the sensor	Li = 0 mH	
Isolation voltage	50 V AC, with integrated overvoltage protection according to EN 61000-6-2	
Other data		
Residual ripple of supply voltage	46 bis 125 Hz: < 0.2 Vpp >125 Hz: <1.2 mV RMS	
Weight	ca. 280 g probe length 10.4/10.7 mm [0.409/ 0.421 Inch] ca. 300 g probe length 50 mm [1.97 Inch] ca. 315 g probe length 100 mm [3.937 Inch] ca. 350 g probe length 250 mm [9.843 Inch] ca. 385 g probe length 350 mm [13.779 Inch]	

Notes:

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

¹⁾ -20 °C [-4 °F] with FPM seal, seal material up to -40 °C [-40°F] on request

²⁾ with M12x1 male connector only possible up to -25 °C [-13°F]

³⁾ with mounted mating connector with appropriate protection class

6.2 ETS 4000 with pressure measurement as an option

General parameters: See 6.1 ETS 4100 / ETS 4500 Standard

Additional technical data with pressure measurement as an option:

Input parameters		ETS 4100				ETS 4500		
Measuring range	bar	16	40	60	100	250	400	600
Overload range	bar	32	80	120	200	500	800	1000
Burst pressure	bar	100	200	300	500	1000	2000	2000
Measuring range	psi	300	500	1000	3000	5000	6000	9000
Overload range	psi	725	1160	2900	7250	11600	11600	14500
Burst pressure	psi	1800	2900	7250	14500	29000	29000	29000
Mechanical Connection		G1/2 A DIN 3852 with probe (45 Nm)						
Torque value		see dimensions						
Parts in contact with fluid		Stainless steel: 1.4542(630); 1.4548(630) Seal: FPM						
Probe length		7 mm						
Output data								
Output signal Pressure		The pressure signal is available as a secondary variable via HART protocol as a digital signal.						
Accuracy to DIN 16086 limit setting	Typ.	≤ ± 0.25 % FS				≤ ± 0.5 % FS		
	Max.	≤ ± 0.5 % FS				≤ ± 1.0 % FS		
Accuracy at minimum setting (B.F.S.L)	Typ.	≤ ± 0.15 % FS				≤ ± 0.25 % FS		
	Max.	≤ ± 0.25 % FS				≤ ± 0.5 % FS		
Temperature compensation Zero point	Typ.	≤ ± 0.008 % / °C [0.004% FS / °F]				≤ ± 0.015 % / °C [0.008% FS / °F]		
	max	≤ ± 0.015 % / °C [0.008% FS / °F]				≤ ± 0.025 % / °C [0.014% FS / °F]		
Temperature compensation Span	Typ.	≤ ± 0.008 % / °C [0.004% FS / °F]				≤ ± 0.015 % / °C [0.008% FS / °F]		
	max	≤ ± 0.015 % / °C [0.008% FS / °F]				≤ ± 0.025 % / °C [0.014% FS / °F]		
Non-linearity at max. setting to DIN 16086	max	≤ ± 0.3 % FS				≤ ± 0.3 % FS		
Hysteresis	max	≤ ± 0.1 % FS				≤ ± 0.4 % FS		
Repeatability		≤ ± 0.05 % FS				≤ ± 0.1 % FS		
Long-term drift	Typ.	≤ ± 0.1 % FS / year				≤ ± 0.3 % FS / year		
Ambient conditions								
Compensated temperature range		-25 .. +85 °C						
Protection class to IEC 60529 ¹⁾		IP 65 (with 1/2 NPT Conduit ≤ 100 bar) IP 67 (connector M12x1, EN175301-803) IP 6K9K (with 1/2 NPT Conduit > 100 bar)						
ISO 20653								
Life expectancy		> 10 million load cycles 0 .. 100 % FS						

¹⁾ with mounted mating connector with appropriate protection class

6.3 Measuring Range Limits

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

Measuring range limits of the primary variable, temperature:

Lower measuring range limit		Upper measuring range limit		Measuring span	
min	max	min	max	min	max
-25 °C	75 °C	0 °C	100 °C	25 °C	125 °C
-13 °F	167 °F	32 °F	212 °F	-13 °F	257 °F

For devices with pressure measurement option ETS 4000-P: Measuring range limits of the secondary variable, pressure:

Lower measuring range limit		Upper measuring range limit		Measuring span	
min	max	min	max	min	max
0 % FS	112.5% FS	37.5% FS	150% FS	37.5% FS	150% FS

6.4 Protocol Data

HART Version: 7

Manufacturer Code: 0x605E

Manufacturer String: HYDAC ELECTRONIC

Device Type Code: 0xE2A8 Variant with temperature as PV and as the only measured value

0xE2A9 Variant with temperature as PV and pressure as SV

7 Model code to identify the delivered part

7.1 Model Code ETS 4000

ETS 4 X X X - F21 - XXX - E X X - XXX (XXX")

Accuracy

1 = 0.4 % typ.
5 = 1 % typ.

Mechanical connection

4 = G 1/4 A ISO 1179-2 (DIN 3852), male thread
7 = 9/16-18 UNF 2A (SAE6), male thread
(only for probe length "010")
8 = 1/4-18 NPT, male thread
(only for probe length "50", "100", "250", "500")

Electrical connection

5 = Male connector, EN175301-803, 3 pole + PE
6 = Male connector M 12 x 1, 4 pol.
9 = 1/2-14 NPT Conduit (male), single lead
G = 1/2-14 NPT Conduit (male thread), jacketed cable

Signal

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

Probe length

010 = 10.4 / 10.7 mm [0.409 / 0.421 Inch] (only with SAE6 or G1/4)
050 = 50 mm [1.97 Inch]
100 = 100 mm [3.937 Inch] (only with G1/4 or 1/4-18 NPT)
250 = 250 mm [9.843 Inch] (only with G1/4 or 1/4-18 NPT)
350 = 350 mm [13.779 Inch] (only with G1/4 or 1/4-18 NPT)

Approval

E = ATEX + IECEx

Insulation voltage

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

Types of protection and applications

	ATEX	IECEx
1 =	I M1 Ex ia I Ma II 1 G Ex ia IIC T6, T5 Ga II 1/2 G Ex ia IIC T6, T5 Ga/Gb II 2 G Ex ia IIC T6, T5 Gb II 1 D Ex ia IIIC T85°C/T95°C Da	Ex ia I Ma Ex ia IIC T6, T5 Ga Ex ia IIC T6, T5 Ga/Gb Ex ia IIC T6, T5 Gb Ex ia IIIC T85°C/T95°C Da
9 =	II 3 G Ex nA IIC T6, T5 Gc only in conjunction with electr. connection "6"	Ex nA IIC T6, T5 Gc
A =	II 1 D Ex ta IIIC T80/T90°C T ₅₀₀ T90/ T ₅₀₀ T100 Da II 2 D Ex tb IIIC T80/T90°C Db only in conjunction with electr. connection "6"	Ex ta IIIC T80/T90°C Da T ₅₀₀ T90/ T ₅₀₀ T100°C Da Ex tb IIIC T80/T90°C Db
C =	II 3 G Ex ic IIC T6, T5 Gc II 3 D Ex ic IIIC T80/T90°C Dc	Ex ic IIC T6, T5 Gc Ex ic IIIC T80/T90°C Dc

Modification Number

000 = Standard

Cable length (e.g. for Conduit connection or jacketed cable)

Shown in m or " (inch)

7.2 Model code ETS 4000 with pressure measurement as an option

ETS 4 X 2 X - F21 - 007 - P - XXXXX - E X X - XXX (XXX")

Mechanical connection

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

Probe length

007 = 7 mm [0.276 inch]

With pressure measurement

digitally via HART interface

Measurement ranges

4 digit for bar version

0016; 0040; 0060; 0100; 0250; 0400; 0600

5 digit for psi version

00300; 00500; 01000; 03000; 05000; 06000; 09000

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):

xyyykzzzzzz

X	Manufacturing year	e.g.: 6 → 2016
yy	Calendar week	e.g.: 23 → KW23
k	Change control status	e.g.: -, A, B
zzzzzz	Sequential serial number	e.g.: 123456

ETS 4145-F21-250-EN1-000
DEKRA 13ATEX0031X

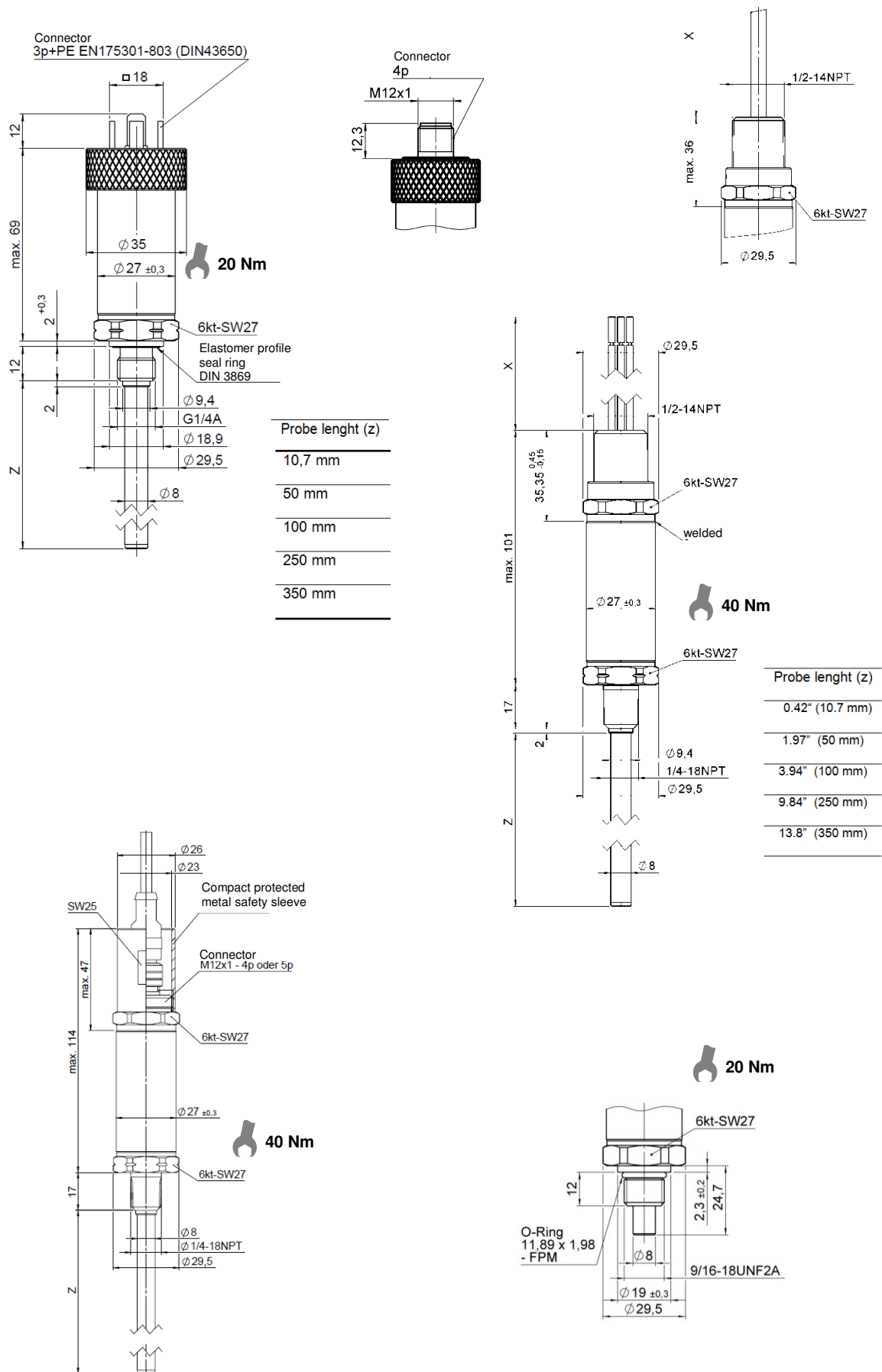
I M1 Ex ia I Ma	  0158	Range: -25...+100°C
II 1G Ex ia IIC T6, T5 Ga		Signal: 4...20 mA
II1/2G Ex ia IIC T6, T5 Ga/Gb		1: +Signal/HART
II 1D Ex ia IIIC T85°C Da		2: -Signal
II 2G Ex ia IIC T6, T5 Gb		PE: Housing

IECEx DEK 14.0011X

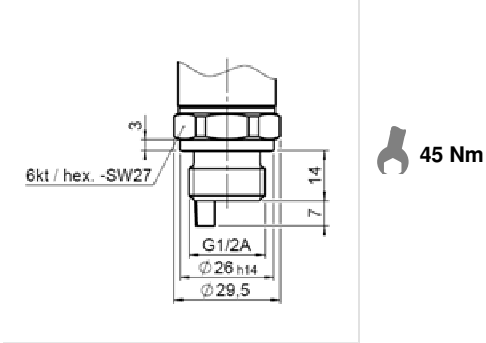
MADE IN GERMANY D-66128 SB Hauptstr.27 926000 IP67

S/N: 623A123456

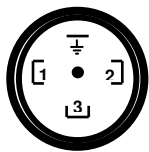

9 Dimensions



Mechanical connection with pressure measurement option

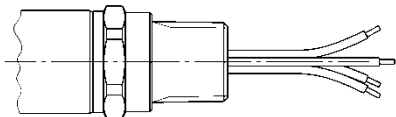


10 PIN connection
Connector EN 175301-803



ETS 4xx5-F21:

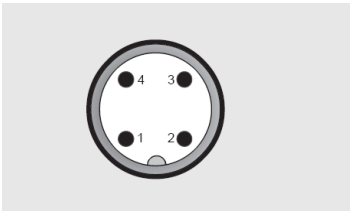
1	Signal+
2	Signal-
3	n.c.
⊥	PE



Conduit (single leads)

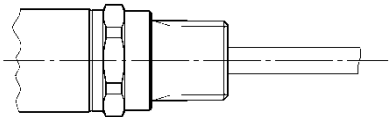
Lead	ETS 45x9-F21
red	Signal +
black	Signal -
green-yellow	Housing

M12x1 plug



ETS 4xx6-F21

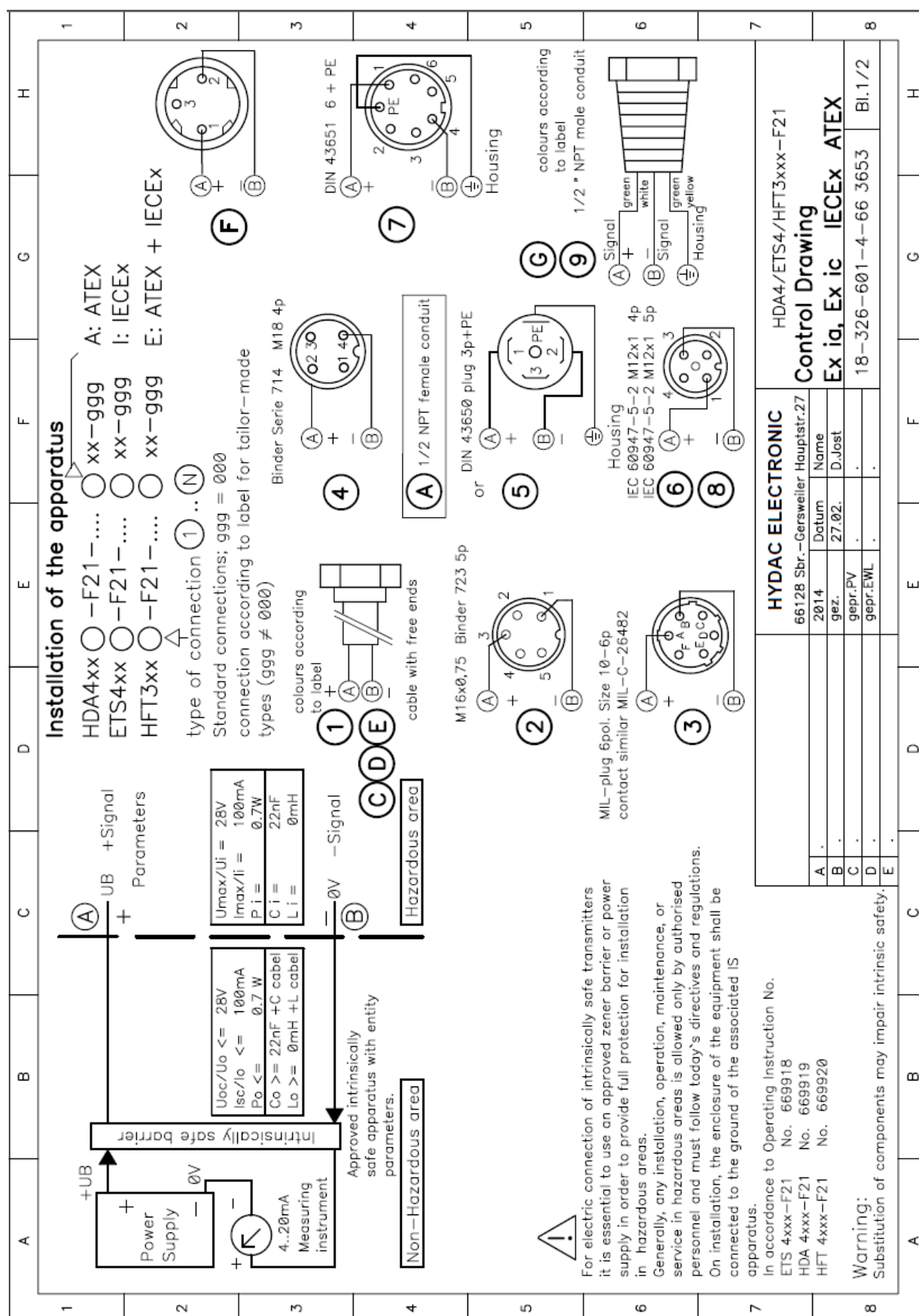
1	Signal+
2	n.c.
3	Signal-
4	n.c.

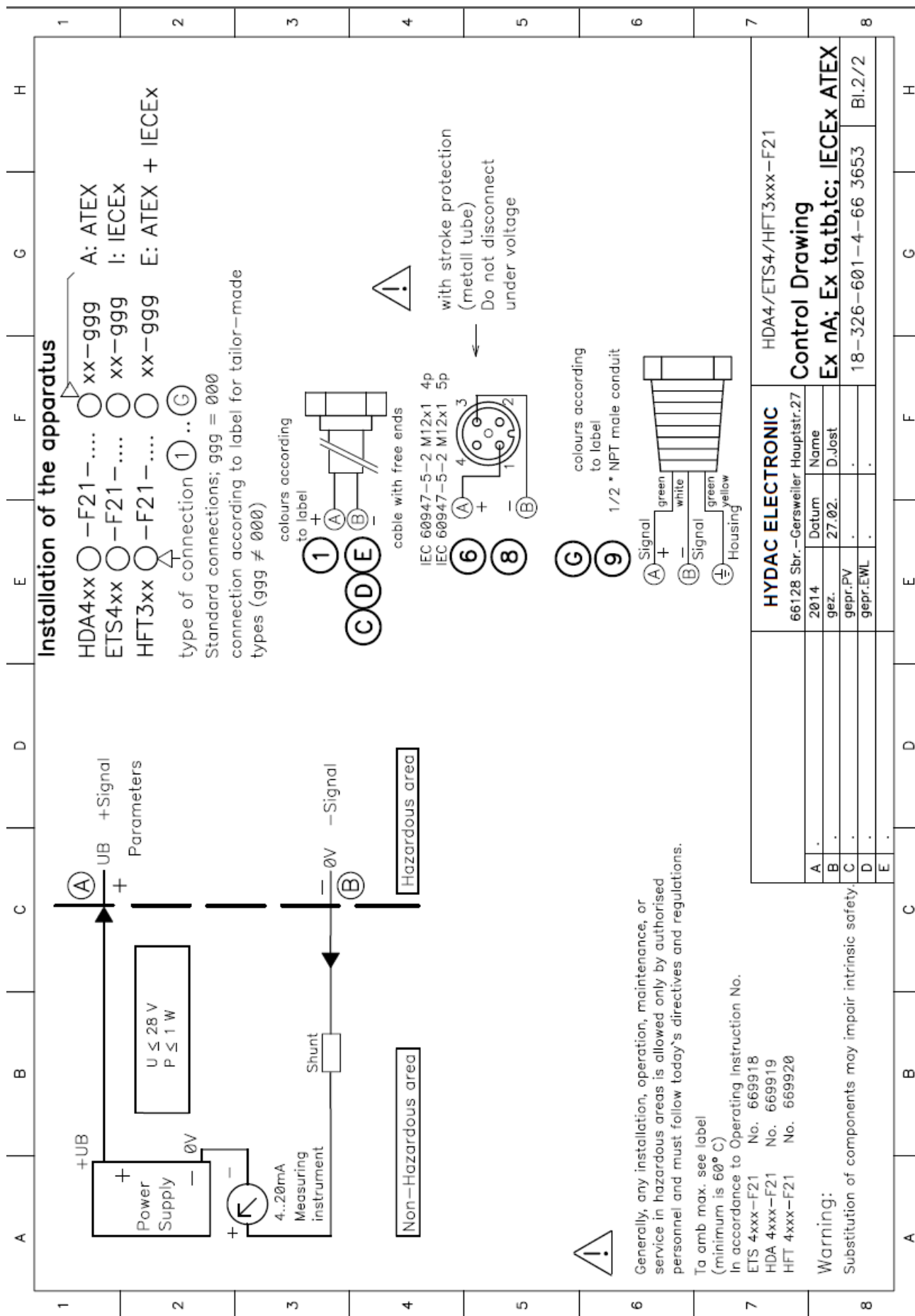


Conduit (jacketed cable)

Lead	ETS 45xG-F21
white	Signal -
brown	Signal +
Green	n.c.
yellow	n.c.

11 Control Drawing





12 Certificates

12.1 Certificate ATEX



CERTIFICATE

(1) EC-Type Examination

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) EC-Type Examination Certificate Number: DEKRA 13ATEX0031 X Issue Number: 2

(4) Equipment: Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...)

(5) Manufacturer: HYDAC Electronic GmbH

(6) Address: Hauptstraße 27, 66128 Saarbrücken, Germany

(7) This equipment 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 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems 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/DEK/ExTR13.0001/xx.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012
EN 60079-31 : 2009

EN 60079-11 : 2012
EN 50303 : 2000

EN 60079-26 : 2007

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to specific conditions of use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment according to the Directive 94/9/EC. Further requirements of the directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:



IM 1	Ex ia I Ma	or
II 1 G	Ex ia IIC T5, T6 Ga	or
II 1/2 G	Ex ia IIC T5, T6 Ga/Gb	or
II 2 G	Ex ia IIC T5, T6 Gb	or
II 1 D	Ex ta IIIC T80 °C ... T100 °C and T ₅₀₀ 90 °C ... T ₅₀₀ 110 °C Da or	
II 1 D	Ex ia IIIC T85 °C or T95 °C Da or	
II 2 D	Ex tb IIIC T80 °C ... T100 °C Db	

This certificate is issued on 28 March 2014 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

M. Erdhuizen
Certification Manager

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

(13) **SCHEDULE**

(14) to EC-Type Examination Certificate DEKRA 13ATEX0031 X

Issue No. 2

(15) **Description**

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...- (...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a Pressure, Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART).

Optionally, a breathing input for pressure equalisation is available.

The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with EN 60529.

Ambient temperature range:

- apparatus in types of protection Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- apparatus in types of protection Ex ta IIIC and Ex tb IIIC: -40 °C to +80 °C.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature:

Max. ambient temperature	Temperature class (Ex ia/IC IIC)	Max. surface temperature "T" (Ex ta/tb/tc IIIC)	Max. surface temperature "T" (Ex ia IIIC)	Max. surface temperature "T ₅₀₀ " (Ex ta IIIC)
60 °C	T6	80 °C	85 °C	90 °C
70 °C	T5	90 °C	95 °C	100 °C
80 °C	--	100 °C		110 °C

Marking

The marking of the Transmitters includes the following codes, depending on the model:

HDA 4...-F21-(...)-...1-(...), ETS 4...-F21-(...)-...1-(...) or HFT 3...-F21-(...)-...1-(...):	I M 1 Ex ia I Ma or II 1 G Ex ia IIC T5, T6 Ga or II 1/2 G Ex ia IIC T5, T6 Ga/Gb or II 2 G Ex ia IIC T5, T6 Gb II 1 D Ex ia IIIC T85 °C or T95 °C Da
HDA 4...-F21-(...)-...2-(...), ETS 4...-F21-(...)-...2-(...) or HFT 3...-F21-(...)-...2-(...):	I M 1 Ex ia I Ma or II 2 G Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-...3-(...), ETS 4...-F21-(...)-...3-(...) or HFT 3...-F21-(...)-...3-(...):	II 2 G Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-...4-(...), ETS 4...-F21-(...)-...4-(...) or HFT 3...-F21-(...)-...4-(...):	II 1 G Ex ia IIC T5, T6 Ga or II 1/2 G Ex ia IIC T5, T6 Ga/Gb or II 2 G Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-...5-(...), ETS 4...-F21-(...)-...5-(...) or HFT 3...-F21-(...)-...5-(...):	I M 1 Ex ia I Ma
HDA 4...-F21-(...)-...A-(...), ETS 4...-F21-(...)-...A-(...) or HFT 3...-F21-(...)-...A-(...):	II 1 D Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da II 2 D Ex tb IIIC T80 °C or T90 °C or T100 °C Db

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Form 100
Version 5 (2013-07)

(13) **SCHEDULE**

(14) to EC-Type Examination Certificate DEKRA 13ATEX0031 X Issue No. 2

Electrical dataEquipment in type of protection Intrinsic safety "i"

Supply/output circuit.(Connection + and -):
 in type of protection intrinsic safety Ex ia I, Ex ia IIC and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
 $U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0,7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Equipment in type of protection Equipment dust ignition protection by enclosure "t"

Supply/output circuit.(Connection + and -):
 $U \leq 28 \text{ V}$; $P_{\max} = 1 \text{ W}$.

From a safety point of view, the circuits of the Pressure and/or Temperature and/or Flow Rate Transmitters type ... -F21-(...)-AN-... shall be considered to be connected to earth.

Installation instructions

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

(16) **Test Report**

No. NL/DEK/ExTR13.0001/xx.

(17) **Specific conditions of use**

1. Transmitters with an enclosure containing light metals, when used in a potentially explosive atmosphere requiring apparatus of equipment category 1 G or M 1, shall be installed such, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.
2. For installation of the transmitter between areas where the use of category 1 apparatus is required and areas where the use of category 2 apparatus is required, the following applies:
 The internal separation element shall be protected against environmental stress, which might adversely affect the separation element. The material of the separation element shall be obtained from the data supplied by the manufacturer.
3. The transmitter may alternatively be used with separately supplied certified cable entries or conduit entries that are rated for the intended application.

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

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. NL/DEK/ExTR13.0001/xx.



CERTIFICATE

(1) Type Examination

(2) Equipment and protective systems intended for use in potentially explosive atmospheres - Directive 94/9/EC

(3) Type Examination Certificate Number: DEKRA 13ATEX0032 Issue Number: 2

(4) Equipment: Pressure and/or Temperature and/or Flow Rate Transmitters
Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...)
and HFT 3...-F21-(...)-...-(...)

(5) Manufacturer: HYDAC Electronic GmbH

(6) Address: Hauptstraße 27, 66128 Saarbrücken, Germany

(7) This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) DEKRA Certification B.V., certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems 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 no. NL/DEK/ExTR13.0001/xx.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 60079-0 : 2012
EN 60079-31 : 2009

EN 60079-11 : 2012

EN 60079-15 : 2010

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This Type Examination Certificate relates only to the design, examination and tests of the specified equipment and not to the manufacturing process and supply of this equipment.

(12) The marking of the equipment shall include the following:



II 3 G Ex nA IIC T4 ... T6 Gc or Ex ic IIC T4 ... T6 Gc
II 3 D Ex tc IIIC T80 °C ... T100 °C Dc or Ex ic IIIC T80 °C ... T100 °C Dc

This certificate is issued on 28 March 2014 and, as far as applicable, shall be revised before the date of cessation of presumption of conformity of (one of) the standards mentioned above as communicated in the Official Journal of the European Union.

DEKRA Certification B.V.

M. Erdhuizen
Certification Manager

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(13) **SCHEDULE**

(14) to Type Examination Certificate DEKRA 13ATEX0032

Issue No. 2

(15) **Description**

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...- (...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a pressure signal into a 4 - 20 mA analogue output signal. Optionally, a breathing input for pressure equalisation is available.

Ambient temperature range -40 °C to +80 °C. (Category 3 D)

Ambient temperature range -40 °C to +85 °C. (Category 3 G)

The enclosure provides a degree of protection of at least IP64 in accordance with EN 60529.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature:

Max. ambient temperature	Temperature class	Max. surface temperature "T"
60 °C	T6	80 °C
70 °C	T5	90 °C
80 °C	—	100 °C
85 °C	T4	—

Marking

The marking of the Pressure Transmitter includes the following codes, depending on the model:

HDA 4...-F21-(...)-...9-(...), ETS 4...-F21-(...)-...9-(...) or HFT 3...-F21-(...)-...9-(...):	II 3 G Ex nA IIC T6, T5, T4 Gc
HDA 4...-F21-(...)-...B-(...), ETS 4...-F21-(...)-...B-(...) or HFT 3...-F21-(...)-...B-(...):	II 3 D Ex tc IIIC T80 °C/T90 °C/T100 °C Dc IP6X
HDA 4...-F21-(...)-...C-(...), ETS 4...-F21-(...)-...C-(...) or HFT 3...-F21-(...)-...C-(...):	II 3 G Ex ic IIC T6, T5, T4 Gc II 3 D Ex ic IIIC T80 °C/T90 °C/T100 °C Dc IP6X

Electrical dataApparatus in type of protection intrinsic safety "i"

Supply/output circuit (connections + and -):

in type of protection intrinsic safety Ex ic IIC, only for connection to an energy limited or intrinsically safe circuit, with the following maximum values:

$U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0,7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Apparatus in types of protection Ex nA and Ex tc

Supply/output circuit (Connection + and -):

$U \leq 28 \text{ V}$; $P_{\max} = 1 \text{ W}$.



(13) **SCHEDULE**

(14) to Type Examination Certificate DEKRA 13ATEX0032

Issue No. 2

Installation instructions

The manual provided with the equipment shall be followed in detail to assure safe operation.

(16) **Test Report**

No. NL/DEK/ExTR13.0001/xx.

(17) **Special conditions for safe use**

None.

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

Covered by the standards listed at (9).

(19) **Test documentation**

As listed in Test Report No. NL/DEK/ExTR13.0001/xx.

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Form 105
Version 5 (2013-07)

12.2 Certificate IECEx

		IECEx Certificate of Conformity	
INTERNATIONAL ELECTROTECHNICAL COMMISSION IEC Certification Scheme for Explosive Atmospheres for rules and details of the IECEx Scheme visit www.iecex.com			
Certificate No.:	IECEx DEK 14.0011X	issue No.:	0
Status:	Current	Certificate history:	
Date of Issue:	2014-03-28	Page 1 of 3	
Applicant:	HYDAC Electronic GmbH Hauptstrasse 27 66128 Saarbrücken Germany		
Electrical Apparatus:	Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...F21 (...)-(...)-(...), ETS 4...F21-(...)-...-(...) and HFT 3...F21-(...)-...-(...)		
Optional accessory:			
Type of Protection:	Ex ia, Ex ic, Ex nA, Ex ta, Ex tb, Ex tc		
Marking:	Ex ia I Ma Ex ia IIC T5, T6 Ga Ex ia IIC T5, T6 Ga/Gb Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da Ex tb IIIC T80 °C or T90 °C or T100 °C Db Ex nA IIC T6, T5, T4 Gc Ex tc IIIC T80 °C/T90 °C/T100 °C Dc Ex ic IIC T6, T5, T4 Gc Ex ic IIIC T80 °C/T90 °C/T100 °C Dc		
Approved for issue on behalf of the IECEx Certification Body:	M. Erdhuizen Certification Manager		
Signature:			
(for printed version)			
Date:	<u>2014-03-28</u>		
1. This certificate and schedule may only be reproduced in full. 2. This certificate is not transferable and remains the property of the issuing body. 3. The Status and authenticity of this certificate may be verified by visiting the Official IECEx Website .			
Certificate issued by:			
DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem The Netherlands			
			



IECEx Certificate of Conformity

Certificate No.: IECEx DEK 14.0011X

Date of Issue: 2014-03-28

Issue No.: 0

Page 2 of 3

Manufacturer: **HYDAC Electronic GmbH**
Hauptstrasse 27
66128 Saarbrücken
Germany

Additional Manufacturing location
(s):

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

STANDARDS:

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

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

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

TEST & ASSESSMENT REPORTS:

A sample(s) of the equipment listed has successfully met the examination and test requirements as recorded in

Test Report:
[NL/DEK/ExTR13.0001/01](#)

Quality Assessment Report:
[DE/BVS/QAR06.0017/05](#)



IECEx Certificate of Conformity

Certificate No.: IECEx DEK 14.0011X

Date of Issue: 2014-03-28

Issue No.: 0

Page 3 of 3

Schedule

EQUIPMENT:

Equipment and systems covered by this certificate are as follows:

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a Pressure and/or Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART). Optionally, a breathing input for pressure equalisation is available. The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with IEC 60529.

Ambient temperature range, depending on type of protection:

- Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- Ex ic IIC and Ex nA IIC: -40 °C to +85 °C;
- Ex ta IIIC, Ex tb IIIC, Ex tc IIIC and Ex ic IIIC: -40 °C to +80 °C.

For more detailed information see annex.

CONDITIONS OF CERTIFICATION: YES as shown below:

1. Transmitters with an enclosure containing light metals, when used in a potentially explosive atmosphere requiring apparatus of equipment protection level Ga or Ma, shall be installed such, that even in the event of rare incidents, an ignition source due to impact or friction between the enclosure and iron/steel is excluded.
2. For installation of the Transmitter between areas where the use of equipment protection level Ga is required and areas where the use of equipment protection level Gb is required, the following applies:
The internal separation element shall be protected against environmental stress, which might adversely affect the separation element. The material of the separation element shall be obtained from the data supplied by the manufacturer.
3. The pressure transmitter may alternatively be used with separately supplied certified cable entries or conduit entries that are rated for the intended application.

Annex: 215811500-14.0011.00-Annex to CoC.pdf



Annex 1 to Certificate of Conformity IECEx DEK 14.0011, Issue 0

Description

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a Pressure and/or Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART). Optionally, a breathing input for pressure equalisation is available.

The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with IEC 60529.

Thermal data

Ambient temperature range, depending on type of protection:

- Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- Ex ic IIC and Ex nA IIC: -40 °C to +85 °C;
- Ex ta IIIC, Ex tb IIIC, Ex tc IIIC and Ex lc IIIC: -40 °C to +80 °C.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature, as listed in following table:

Max. ambient temperature	Temperature class (Ex nA IIC, Ex ia/ic IIC)	Max. surface temperature "T" (Ex ta/tb/tc IIIC, Ex lc IIIC)	Max. surface temperature "T" (Ex ia IIIC)	Max. surface temperature "T ₅₀₀ " (Ex ta IIIC)
60 °C	T6	80 °C	85 °C	90 °C
70 °C	T5	90 °C	95 °C	100 °C
80 °C	--	100 °C		110 °C
85 °C	T4	--	--	--

Electrical data

Equipment in type of protection Intrinsic safety "I"

Supply/output circuit.(Connection + and -):

in type of protection intrinsic safety Ex ia I, Ex ia IIC, Ex ia IIIC, Ex ic IIC and Ex ic IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0.7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Equipment in type of protection Equipment dust ignition protection by enclosure "I" and type "n" (non-sparking nA)

Supply/output circuit.(Connection + and -):

$U \leq 28 \text{ V}$; $P_{\max} = 1 \text{ W}$.

From a safety point of view, the circuits of the transmitters type ... -F21-(...)-N-... shall be considered to be connected to earth.

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Form 124
Version 2 (2013-07)

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Annex 1 to Certificate of Conformity IECEx DEK 14.0011, issue 0

Marking

The marking of the Transmitters includes the following codes, depending on the model:

HDA 4...-F21-(...)-.1-(...), ETS 4...-F21-(...)-.1-(...) or HFT 3...-F21-(...)-.1-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da
HDA 4...-F21-(...)-.2-(...), ETS 4...-F21-(...)-.2-(...) or HFT 3...-F21-(...)-.2-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-.3-(...), ETS 4...-F21-(...)-.3-(...) or HFT 3...-F21-(...)-.3-(...):	Ex ia IIC T5, T6 Gb
HDA 4...-F21-(...)-.4-(...), ETS 4...-F21-(...)-.4-(...) or HFT 3...-F21-(...)-.4-(...):	Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da
HDA 4...-F21-(...)-.5-(...), ETS 4...-F21-(...)-.5-(...) or HFT 3...-F21-(...)-.5-(...):	Ex ia I Ma
HDA 4...-F21-(...)-.A-(...), ETS 4...-F21-(...)-.A-(...) or HFT 3...-F21-(...)-.A-(...):	Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da Ex tb IIIC T80 °C or T90 °C or T100 °C Db
HDA 4...-F21-(...)-.9-(...), ETS 4...-F21-(...)-.9-(...) or HFT 3...-F21-(...)-.9-(...):	Ex nA IIC T6, T5, T4 Gc
HDA 4...-F21-(...)-.B-(...), ETS 4...-F21-(...)-.B-(...) or HFT 3...-F21-(...)-.B-(...):	Ex tc IIIC T80 °C/T90 °C/T100 °C Dc
HDA 4...-F21-(...)-.C-(...), ETS 4...-F21-(...)-.C-(...) or HFT 3...-F21-(...)-.C-(...):	Ex ic IIC T6, T5, T4 Gc Ex ic IIIC T80 °C/T90 °C/T100 °C Dc



Annex 1 to Certificate of Conformity IECEx DEK 14.0011, issue 0

Description

Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4...-F21-(...)-...-(...), ETS 4...-F21-(...)-...-(...) and HFT 3...-F21-(...)-...-(...) are two wire transmitters used to convert a Pressure and/or Temperature and/or Flow Rate signal into a 4 - 20 mA output signal with digital communication (HART). Optionally, a breathing input for pressure equalisation is available. The electrical connections are made by a connector or via a permanently connected cable.

The enclosure provides a degree of protection of at least IP64 in accordance with IEC 60529.

Thermal data

Ambient temperature range, depending on type of protection:

- Ex ia IIC and Ex ia IIIC: -40 °C to +70 °C;
- Ex ic IIC and Ex nA IIC: -40 °C to +85 °C;
- Ex ta IIIC, Ex tb IIIC, Ex tc IIIC and Ex ic IIIC: -40 °C to +80 °C.

The temperature class and the maximum surface temperature of the enclosure is depending on the maximum ambient temperature, as listed in following table:

Max. ambient temperature	Temperature class (Ex nA IIC, Ex ia/ic IIC)	Max. surface temperature "T" (Ex ta/tb/tc IIIC, Ex ic IIIC)	Max. surface temperature "T" (Ex ia IIIC)	Max. surface temperature "T ₅₀₀ " (Ex ta IIIC)
60 °C	T6	80 °C	85 °C	90 °C
70 °C	T5	90 °C	95 °C	100 °C
80 °C	--	100 °C		110 °C
85 °C	T4	--	--	--

Electrical data

Equipment in type of protection Intrinsic safety "I"

Supply/output circuit.(Connection + and -):

in type of protection intrinsic safety Ex ia I, Ex ia IIC, Ex ia IIIC, Ex ic IIC and Ex ic IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:

$U_i = 28 \text{ V}$; $I_i = 100 \text{ mA}$; $P_i = 0.7 \text{ W}$; $C_i = 22 \text{ nF}$; $L_i = 0 \text{ mH}$.

Equipment in type of protection Equipment dust ignition protection by enclosure "t" and type "n" (non-sparking nA)

Supply/output circuit.(Connection + and -):

$U \leq 28 \text{ V}$; $P_{\text{max}} = 1 \text{ W}$.

From a safety point of view, the circuits of the transmitters type ... -F21-(...)-N-... shall be considered to be connected to earth.

Page 1 of 2

Form 124
Version 2 (2013-07)

DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands
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Annex 1 to Certificate of Conformity IECEx DEK 14.0011, issue 0

Marking

The marking of the Transmitters includes the following codes, depending on the model:

HDA 4...-F21-(...)-.1-(...), ETS 4...-F21-(...)-.1-(...) or HFT 3...-F21-(...)-.1-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da	
HDA 4...-F21-(...)-.2-(...), ETS 4...-F21-(...)-.2-(...) or HFT 3...-F21-(...)-.2-(...):	Ex ia I Ma or Ex ia IIC T5, T6 Gb	
HDA 4...-F21-(...)-.3-(...), ETS 4...-F21-(...)-.3-(...) or HFT 3...-F21-(...)-.3-(...):	Ex ia IIC T5, T6 Gb	
HDA 4...-F21-(...)-.4-(...), ETS 4...-F21-(...)-.4-(...) or HFT 3...-F21-(...)-.4-(...):	Ex ia IIC T5, T6 Ga or Ex ia IIC T5, T6 Ga/Gb or Ex ia IIC T5, T6 Gb Ex ia IIIC T85 °C or T95 °C Da	
HDA 4...-F21-(...)-.5-(...), ETS 4...-F21-(...)-.5-(...) or HFT 3...-F21-(...)-.5-(...):	Ex ia I Ma	
HDA 4...-F21-(...)-.A-(...), ETS 4...-F21-(...)-.A-(...) or HFT 3...-F21-(...)-.A-(...):	Ex ta IIIC T80 °C T ₅₀₀ 90 °C or T90 °C T ₅₀₀ 100 °C or T100 °C T ₅₀₀ 110 °C Da Ex tb IIIC T80 °C or T90 °C or T100 °C Db	
HDA 4...-F21-(...)-.9-(...), ETS 4...-F21-(...)-.9-(...) or HFT 3...-F21-(...)-.9-(...):	Ex nA IIC T6, T5, T4 Gc	
HDA 4...-F21-(...)-.B-(...), ETS 4...-F21-(...)-.B-(...) or HFT 3...-F21-(...)-.B-(...):	Ex tc IIIC T80 °C/T90 °C/T100 °C Dc	
HDA 4...-F21-(...)-.C-(...), ETS 4...-F21-(...)-.C-(...) or HFT 3...-F21-(...)-.C-(...):	Ex ic IIC T6, T5, T4 Gc Ex ic IIIC T80 °C/T90 °C/T100 °C Dc	

13 Declaration of conformity

Datum
Ihr Zeichen
Ihre Nachricht
Unser Zeichen

Betreff

HYDAC ELECTRONIC GMBH, Hauptstraße 27, 66128 Saarbrücken

HYDAC ELECTRONIC GMBH

Hauptstraße 27
66128 Saarbrücken, Deutschland

Telefon Zentrale 06897 509-01
Fax Einkauf 06897 509-1745
Fax Verkauf 06897 509-1735

Internet: www.hydac.com
siehe dort auch: Allgemeine Geschäftsbedingungen (AGB)

Telefon direkt
Telefax direkt
E-Mail



EU-Konformitätserklärung / EC declaration of conformity 18 / 121- / 15

Hiermit erklären wir, 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 Normen entspricht.

Bei einer nicht mit uns schriftlich abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit.

We herewith declare 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.

This declaration ceases to be valid if the product is modified without our written consent.

Bezeichnung / Designation	Tempertur Messumformer / Temperatur Transducer
Typ	ETS 4xxx-F21-xxx-(P-xxxx)-A/Exxx....
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-1 Ok1 07/ -2-März06/ - 3 / 4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	94/9 EG
Normen	EN 60079-0: 2012 ; -11: 2012 ; -26 2007 EN 60079-31: 2009 ; EN 50303: 2000
EG Baumusterprüfbescheinigung / EC -Type Examination Certificate :	KEMA 13 ATEX 0031X Issue: 2
DEKRA Certification B.V Utrechtseweg 310; NL 6812 AR Arnheim	
Prüfstelle / notified body :	DEKRA EXAM Nr. : no: 0158

Schutzartkennzeichen / Code for Type protection :

I M1 Exia I Ma ; II 1G Ex ia IIC T5, T6 Ga; II 1/2G Ex ia IIC T5, T6 Ga/Gb;
II 2G Ex ia IIC T5, T6 Gb
II 1D Ex ta IIIC T80...100°C and T500 90...110°C Da ; II 1D Ex ia IIIC T85°C or 95°C Da ;
II 2D Ex tb IIIC T80...100°C Db

04.05.2015

J. Morsch

Datum / Date

Name /

(CE-Bekräftiger) / (CE-authorized person)

630108

Geschäftsführer:
Matthias Dietel
Dr. Franz Josef Eckle

Sitz der Gesellschaft:
66128 Saarbrücken

Registergericht:
Saarbrücken, HRB 8707

USt-Identnummer: DE 138 277 443

Steuernummer: 040/11050684

Bankverbindungen in Saarbrücken:

Commerzbank AG
Nr. 310808000, BLZ 590 800 00
BIC: COMDE333
IBAN: DE 77 5908 0090 0316 8888 00
Hypo Vereinsbank
Nr. 353560204, BLZ 590 200 90
BIC: HYVE DE 33
IBAN: DE 58 5902 0090 0353 5682 84

SaarLB

Nr. 5250006, BLZ 590 500 00
BIC: SALA DE 33
IBAN: DE 51 5905 0000 0005 2500 06

Deutsche Bank AG
Nr. 035500000, BLZ 590 700 00
BIC: DEUT DE 33
IBAN: DE 54 5907 0000 0035 5800 00

HYDAC ELECTRONIC

HYDAC ELECTRONIC GMBH, Hauptstraße 27, 66128 Saarbrücken

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66128 Saarbrücken, DeutschlandTelefon Zentrale 06897 509-01
Fax Einkauf 06897 509-1745
Fax Verkauf 06897 509-1735Internet: www.hydac.com
siehe dort auch: Allgemeine Geschäftsbedingungen (AGB)Datum
Ihr Zeichen
Ihre Nachricht
Unser ZeichenTelefon direkt
Telefax direkt
E-Mail

Betreff

EU-Konformitätserklärung / EC declaration of conformity 18 / 122- / 15

Hiermit erklären wir, 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 Normen entspricht.

Bei einer nicht mit uns schriftlich abgestimmten Änderung des Produktes verliert diese Erklärung ihre Gültigkeit.

We herewith declare 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.

This declaration ceases to be valid if the product is modified without our written consent.

Bezeichnung / Designation	Druckmessumformer / Pressure Transducer
Typ	ETS 4xxx-F21-xxx-(P-xxxxx)-A/Exx...
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-1 Okt 07/ -2-März06/ - 3 /4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	94/9 EG
Normen	EN 60079-0: 2012 ; -11: 2012 ; -15: 2010 EN 60079-31: 2009
EG Baumusterprüfbescheinigung / EC -Type Examination Certificate :	DEKRA 13 ATEX 0032 Issue: 2
DEKRA Certification B.V Utrechtseweg 310; NL 6812 AR Arnhem	
Prüfstelle / notified body :	DEKRA EXAM Nr. : no: 0158

Schutzartkennzeichen / Code for Type protection :

II 3G Ex nA IIC T4..T6 Gc or Ex ic IIC T4..T6 Gc
II 3D Ex tc IIIC T80..100°C Dc or Ex ic IIIC T80..100°C Dc

04.05.2015

J. Morsch

Datum / Date

Name /

(CE-Beauftragter) / (CE-authorized person)

Geschäftsführer:
Mathias Dieler
Dr. Franz Josef EickelSitz der Gesellschaft:
66128 Saarbrücken
Registergericht:
Saarbrücken, HRB 8707
USt-Identnummer: DE 138 277 443
Steuernummer: 040/110/50694Bankverbindungen in Saarbrücken:
Commerzbank AG
Nr. 31688800, BLZ 500 600 00
BIC: COMDE33HAN
IBAN: DE 77 5900 0090 0316 8888 00
Mypo Vereinsbank
Nr. 353568284, BLZ 500 200 00
BIC: HYVEDE33HAN
IBAN: DE 50 5902 0090 0353 5682 84SaarlB
Nr. 5250006, BLZ 500 500 00
BIC: SALA DE 55 XXXX
IBAN: DE51 5905 0000 0005 2500 08
Deutsche Bank AG
Nr. 035500000, BLZ 500 700 00
BIC: DEUT DE 33 XXXX
IBAN: DE 54 5007 0000 0035 5000 00

630408

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Tel.: +49-(0)6897-509-01
Fax: +49-(0)6897-509-1726

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

HYDAC SERVICE GMBH
Hauptstr. 27
D-66128 Saarbrücken
Germany

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

Note

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

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

All technical details are subject to change without notice.