HYDAC ELECTRONIC

Bedienungsanleitung
Volumenstrommessumformer Serie HFT 3100
mit HART Schnittstelle
Eigensicher, staubgeschütztes Gehäuse, nicht funkend
ATEX und **IECEx** 2-fach-Zulassung

(Original-Bedienungsanleitung)

Operating Manual
Flow Rate Transmitter Series HFT 3100
with HART Interface
Intrinsically safe, dustproof enclosure,Non-sparking
ATEX and **IECEx**, dual approval

(Translation of the original operating instructions)

Schutzklassen und Einsatzbereiche / Protection Types and Zones:

ATEX		
DEKRA 13ATEX 0031X	**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**
	II 1D	**Ex ta IIIC T80/90/100°C T_{500} 90/100/110°C Da**
	II 2D	**Ex tb IIIC T80/90/100°C Db**
DEKRA 13ATEX 0032X	**II 3G**	**Ex nA IIC T6, T5, T4 Gc**
	II 3G	**Ex ic IIC T6, T5, T4 Gc**
	II 3D	**Ex tc IIIC T80/90/100°C Dc**
	II 3D	**Ex ic IIIC T80/90/100°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/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	

Inhaltsverzeichnis

1 Allgemeines

Falls Sie Fragen bezüglich der technischen Daten oder Eignung für Ihre Anwendungen haben, wenden Sie sich bitte an unseren **technischen Vertrieb**. Die Volumenstrommessumformer der Serie HFT 3100 werden auf rechnergesteuerten Prüfplätzen abgeglichen und einem Endtest unterzogen. Sie sind wartungsfrei und sollten beim Einsatz innerhalb der Spezifikationen (siehe Technische Daten) einwandfrei arbeiten. Falls trotzdem Fehler auftreten, wenden Sie sich bitte an den **HYDAC-Service**. Fremdeingriffe in das Gerät führen zum Erlöschen jeglicher Gewährleistungsansprüche sowie der ATEX und IECEx-Zulassung.

2 Funktion

Das vom Sensor gemessene Volumenstromsignal wird in ein dem Volumenstrom proportionales, 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

Der Einbau des Messumformers sollte in eine gerade Rohrstrecke erfolgen. Der Einbau unmittelbar hinter Krümmungen, Verzweigungen oder Ventilen ist zu vermeiden. Bei einer geforderten Reproduzierbarkeit von 1%, muss die Länge der Beruhigungsstrecke auf der Einströmseite das 10-fache und auf der Ausströmseite das 5-fache des Nenndurchmessers betragen. Um eine Reproduzierbarkeit < 1 % zu erreichen müssen diese Strecken verdoppelt werden. Um in kritischen Anwendungsfällen (z.B.: starke Vibrationen oder Schläge) einer mechanischen Zerstörung vorzubeugen, empfehlen wir die Volumenstrommessumformer mittels flexibler Schlauchstücke zu entkoppeln.

Das Rohr muss ständig mit Flüssigkeit gefüllt sein; Lufteinschlüsse verfälschen das Messergebnis.

Vor dem Einbau sollte das Rohrleitungssystem gespült werden, damit keine Festkörper in die Turbine gelangen. Die maximal zulässige Korngröße von Verschmutzungen für den Messbereich 1,2..20 l/min liegt bei 0,1mm und für die Messbereiche 6..60 l/min, 15..300 l/min und 40..600 l/min bei 0,3 mm. Faserige Verschmutzungen sind absolut zu vermeiden. Die Viskosität des Mediums darf 100 cSt nicht überschreiten, da hohe Viskositäten zu einer Beschädigung der Turbine führen können. Die Turbinen sind standardmäßig bei einer Viskosität von 30 cSt kalibriert. Bei Viskositätsabweichungen von mehr als +/- 5 cSt ist mit nichtlinearen Verfälschungen zu rechnen (ca. 2,5 % bei +/- 20 cSt).

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

Die Volumenstrommessumformer der Serie HFT 3100 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 Volumenstrommessumformergehäuses mittels des Prozessanschlusses oder dem ½ NPT Conduit erreicht. Sofern eine grün/gelbe Ader vorhanden ist, darf diese zusätzlich, aber nicht zur alleinigen Erdung verwendet werden. Bei Schlauchmontage des Volumentrommessumformers muss das Gehäuse separat geerdet werden.

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

Bei der Serie HFT 3100 in der Ausführungsform H (Isolationsspannung ≤ 500 VAC) darf die Kabellänge zum Volumentrommessumformer maximal 30m betragen (Überspannungsschutz nach DIN EN 61000-6-2). Wenn die Kabellänge 30m überschreitet, muss der Überspannungsschutz kundenseitig sichergestellt werden.

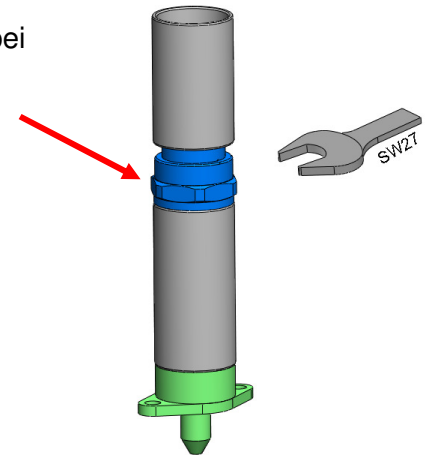
4 Wichtige Hinweise für die Installation

4.1 Installationshinweise für Geräte mit 1/2 “ NPT Conduit

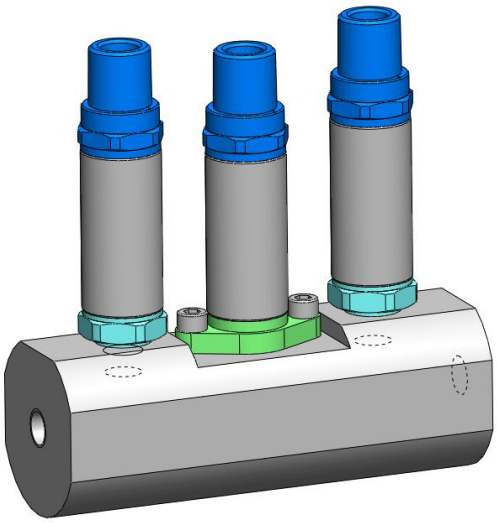
Elektrische Installation

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

Zum Fixieren des Sensors bei der Conduit-Installation verwenden!



Darstellung mit zusäzlich montiertem Druck- und Temperaturmessumformer**:**



4.2 Installationshinweis für Geräte mit Schlagschutz

Installationshinweise für Geräte mit M12×1 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 T_{500}90/100°C Da
II 2D Ex tb III C T80/T90°C Db

IECEx

Ex nA IIC T6, T5 Gc

Ex ta IIIC T80/T90°C T_{500}90/100°C Da

Ex tb III C T80/90°C Db

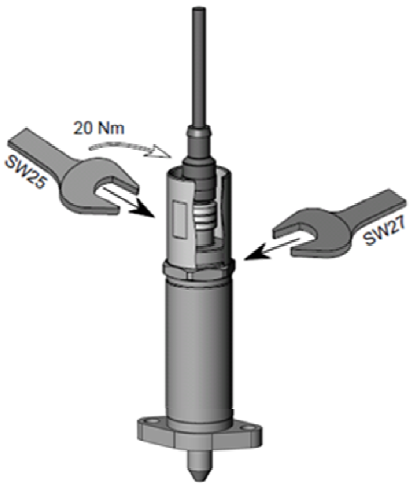
Zur Einhaltung der Sicherheitsrichtlinien ist, für diese Schutzklassen und Einsatzbereiche, die Verwendung der Schlagschutz-/ Sicherungs- Metallhülse zwingend erforderlich.

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

Das Anschlusskabel mit M12x1 Stecker muss im spannungslosen Zustand ordnungsgemäß angeschlossen werden, damit sich die Steckverbindung bei Vibrationen nicht lösen kann.

Die mitgelieferte Schlagschutz-/Sicherungs-Metallhülse muss ebenfalls ordnungsgemäß mit einem Anzugsdrehmoment von 20 Nm montiert werden.

Auch die Trennung des M12x1 Steckers darf nur im Spannungslosen Zustand erfolgen.



Zum Fixieren des Sensors bei der Montage der Schlagschutz-/Sicherungsmetallhülse verwenden!

5 Sicherheitshinweise

Wenn das Etikett nicht mehr lesbar ist, muss der Volumenstrommessumformer außer Betrieb gesetzt werden.
Die Volumenstrommessumformer sind generell mit einer geeigneten, eigensicheren Barriere zu betreiben.

Dichtungen sind in regelmäßigen Abständen, in Abhängigkeit der klimatischen Bedingungen und dem Medieneinfluss, auf ihre Funktionstüchtigkeit zu kontrollieren, und wenn erforderlich auszutauschen. 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 Volumenstrommessumformers zu achten, ebenso ist der Betriebsdruck unbedingt einzuhalten (Angaben hierzu siehe "Technische Daten" und "Sicherheitstechnische Daten" der EG Baumusterprüfbescheinigung).

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 Volumenstrommessumformer geschützt vor Beschädigungen und Schlag anzubringen.
Aus Sicherheitsgründen sollten Stromversorgung / Ausgangsstromkreis des Volumenstrom-messumformers geerdet werden.

Zur Einhaltung der Sicherheitsrichtlinien ist für die Schutzklassen und Einsatzbereiche:
ATEX:
II 3G Ex nA IIC T6, T5 Gc /II 1D Ex ta IIIC T80/90°C T_{500}90/100°C Da und II 2D Ex tb III C T80/90°C Db,
IECEx:
Ex nA IIC T6, T5 Gc / Ex ta IIIC T80/90°C T_{500}90/100°C Da und Ex tb III C T80/90°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
HFT 3100

Eingangskenngrößen			
Messbereich - und Betriebsdruck			
HFT 31XX- F21-0020	1.2 .. 20.0 l/min 420 bar		0.32 .. 5.28 gpm 6090 psi
HFT 31XX- F21-0060	6.0 .. 60.0 l/min 420 bar		1.59 .. 15.85 gpm 6090 psi
HFT 31XX- F21-0300	15.0 .. 300.0 l/min 420 bar		3.96 .. 79.25 gpm 6090 psi
HFT 311X- F21-0600	40.0 .. 600.0 l/min 420 bar		10.57 .. 158.5 gpm 6090 psi
Mechanischer Anschluss (Anschlussdrehmoment)			
HFT 31XX- F21-0020	$G^{1/4}$ (35 Nm)	1/2 NPT (2.0-3.0 turns)	SAE8 (60 Nm)
HFT 31XX- F21-0060	$G^{1/2}$ (65 Nm)	1/2 NPT (1.5-2.5 turns) 1 NPT (2.0-3.0 turns)	SAE14 (140 Nm)
HFT 31XX- F21-0300	$G1^{1/4}$ (240 Nm)	$1^{1/2}$ NPT (1.5-2.5 turns)	SAE20 (290 Nm)
HFT 31XX- F21-0600	$G1^{1/2}$ (290 Nm)	$1^{1/2}$ NPT (1.5-2.5 turns)	SAE24 (325 Nm)
Zusätzliche Anschlussmöglichkeiten [1]	2xG1/4 oder 2xSAE6 Innengewinde für Druck und/oder Temperatur-sensoren mit entsprechender Zulassung		
Gehäusewerkstoff	Edelstahl 1.4404		
Medienberührende Teile	Edelstahl: 1.4404, 1.4460, Wolframkarbid		

Ausgangsgrößen			
Ausgangssignal , zulässige Bürde	4...20 mA, 2-Leiter, mit HART Protokoll $R_{Lmax.}$=(UB - 12 V) / 20 mA [kΩ] für HART Kommunikation min. 250 Ω		
	HART Kommunikation gemäß HART 7 Spezifikation		
	HART Common Practice Commands z. B. Ändern der Messbereichsgrenzen (siehe Tabelle)		
Genauigkeit	≤ 2% des Momentanwertes		

Umgebungsbedingungen			
Betriebs- und Umgebungstemperaturbereich	T6, T80/T85°C, T_{500}90°C:	Ta = -40 .. 60°C	-40 .. +140 °F
	T5, T90/T95°C,T_{500}100°C:	Ta = -40 .. 70°C	-40 .. +158 °F
	T100, T_{500}110°C :	Ta = -40 .. 80°C	-40 .. +176 °F
	T4	Ta = -40 .. 85°C	-40 .. +185 °F
Lagertemperaturbereich	-40 .. +100 °C		
Mediumstemperaturbereich	T6, T80/T85°C, T_{500}90°C:	Ta = -40 .. 60°C	-40 .. +140 °F
	T5, T90/T95°C,T_{500}100°C:	Ta = -40 .. 70°C	-40 .. +158 °F
	T100, T_{500}110°C :	Ta = -40 .. 80°C	-40 .. +176 °F
	T4	Ta = -40 .. 85°C	-40 .. +185 °F
CE -Zeichen	EN 61000-6-1 /-2 / -3 /-4 , EN 60079-0 /11/15/26/ 31, EN 50303		
Vibrationsbeständigkeit nach DIN EN 60068-2-6 bei 10 ..500Hz	≤ 10 g		
Schutzart nach DIN EN 60529[2] Schutzart nach ISO 20653	IP 67 (M12x1) IP 6K9K (mit 1/2 NPT Conduit)		

Relevante Daten für die Ex-Anwendung	**Ex ia, ic**	**Ex nA, ta, tb, tc**
Versorgungsspannung	Ui = 12 .. 28 V DC	12 .. 28 V DC
Maximaler Speisestrom	Ii = 100 mA	
Maximale Speiseleistung	Pi = 0,7W	max. Leistungsaufnahme ≤ 1W
Anschlusskapazität des Sensor	C_i = ≤ 22 nF	
Induktivität des Sensor	L_i = 0 mH	
Isolationsspannung[3]	50 VAC, mit integriertem Überspannungsschutz nach EN 61000-6-2 oder 500 VAC	

Sonstige Größen	
Restwelligkeit Versorgungsspannung	gemäß FSK Physical Layer Specification (HCF_SPEC_054)
Stromaufnahme	≤ 25 mA
Verpolungsschutz der Versorgungsspannung, Überspannungs-, Übersteuerungsschutz und Lastkurzschlussfestigkeit	vorhanden
Messmedium	Hydrauliköl, wasserbasierende Fluide
Viskositätsbereich	1 .. 100 cSt
Kalibrier-Viskosität	30 cSt
Gewicht:	
HFT 311X- F21-0020	2,5 kg
HFT 311X- F21-0060	4,0 kg
HFT 311X- F21-0300	5,7 kg
HFT 311X- F21-0600	7,0 kg

Anmerkungen:

[1] Nicht für Messbereiche 1,2 .. 20l/min (0.32 .. 5.28 gpm)

[2] bei montierter Kupplungsdose entsprechender Schutzart

[3] siehe Typenschlüssel „Isolationsspannung“

6.1 Messbereichsgrenzen

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

Untere Messbereichsgrenze		Obere Messbereichsgrenze		Messspanne	
min	max	min	max	min	max
0 % FS	75 % FS	25 % FS	100 % FS	25 % FS	100 % FS

6.2 Protokolldaten

HART Version: 7
Manufacturer Code: 0x605E
Manufacturer String: HYDAC ELECTRONIC
Device Type Code: 0xE0FE Volumenstrom als PV und einziger Messgröße.

7 Typenschlüssel zur Identifikation des gelieferten Gerätes

7.1 Typenschlüssel

HFT 31 X X - F21 - XXXX - S –X- E X X - 000 (XXX)

Prozessanschluss

1= G ¼“ nur für Messbereich: 1,2 .. 20 l/min
3 = G ½ “ nur für Messbereich: 6 .. 60 l/min
6 = G 1 ¼“ nur für Messbereich: 15 .. 300 l/min
7 = G 1 ½ “ nur für Messbereich: 40 .. 600 l/min
8 = SAE 8 nur für Messbereich: 1,2 .. 20 l/min
9 = SAE 14 nur für Messbereich: 6 .. 60 l/min
A = SAE 20 nur für Messbereich: 15 .. 300 l/min
B = SAE 24 nur für Messbereich: 40 .. 600 l/min
C = ½ NPT nur für Messbereich: 1,2 .. 20 l/min, 6 .. 60 l/min
D = 1 NPT nur für Messbereich: 6 .. 60 l/min
E = 1 ½ NPT nur für Messbereich: 15 .. 300 l/min, 40 .. 600 l/min
F = Flansch, SAE 24 code 62 nur für Messbereich: 40 .. 600 l/min
G = Flansch, SAE 20 code 62 nur für Messbereich: 15 .. 300 l/min

Elektrischer Anschluss

6 = Gerätestecker, M 12 x 1, 4 pol. (ohne Kupplungsdose)
9 = 1/2-14 NPT Conduit (Außengewinde) Einzeladern
G = 1/2-14 NPT Conduit (Außengewinde) freies Kabelende

Signal

F21 = 4 .. 20 mA, 2-Leiter, mit HART Schnittstelle

Messbereiche

0020= 1,2 .. 20 l/min (0.32 .. 5.28 gpm)
0060 = 6 .. 60 l/min (1.59 .. 15.85 gpm)
0300 = 15 .. 300 l/min (3.96 .. 79.25 gpm)
0600 = 40 .. 600 l/min (10.57 .. 158.5 gpm)

Gehäusewerkstoff

S = Edelstahl

Gehäuseausführung

1 = ohne zusätzliche Bohrung (Messbereich 0020)
2 = mit 2 zusätzlichen Innengewinden G ¼ ISO 1179-2 (Messbereiche 0060,0300,0600)
3 = mit 2 zusätzlichen Innengewinden SAE 6 (Messbereiche 0060,0300,0600)

Zulassung

E = ATEX und IECEx (genauere Angaben siehe Zertifikate)

Isolationsspannung

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

Schutzklassen und Einsatzgebiete (Kennzahl)

	ATEX	**IECEx**
1 =	I M1 Ex ia I Ma	Ex ia I Ma
	II 1G Ex ia IIC T6,T5 Ga	Ex ia IIC T6,T5 Ga
	II 1/2 G Ex ia IIC T6,T5 Ga/Gb	Ex ia IIC T6,T5 Ga/Gb
	II 2 G Ex ia IIC T6,T5 Gb	Ex ia IIC T6,T5 Gb
	II 1D Ex ia IIIC T85°C/T95°C Da	Ex ia IIIC T85°C/T95°C Da
9 =	II 3G Ex nA IIC T6, T5 Gc	Ex nA IIC T6, T5 Gc
	Nur in Verbindung mit elektrischem Anschluss „6“ und der Schlagschutz-Sicherungs-Metallhülse (siehe auch Geräteabmessungen)	
A =	II 1D Ex ta IIIC T80/T90°C T_{500}T90/ T_{500}T100 Da	Ex ta IIIC T80/T90°C Da T_{500}T90/ T_{500}100°C Da
	II 2D Ex tb IIIC T80/T90°C Db	Ex tb IIIC T80/T90°C Db
	Nur in Verbindung mit elektrischem Anschluss „6“ und der Schlagschutz-Sicherungs-Metallhülse (siehe auch Geräteabmessungen)	
C =	II 3G Ex ic IIC T6, T5 Gc	Ex ic IIC T6, T5 Gc
	II 3D Ex ic IIIC T80/T90°C Dc	Ex ic IIIC T80/T90°C Dc

Modifikationsnummer

000 = Standard

Kabellänge (z.B. für Conduit-Rohranschluss)
Angabe in m oder “ (inch) im Klartext

7.2 Auswertetabelle: Zuordnung der Schutzklassen

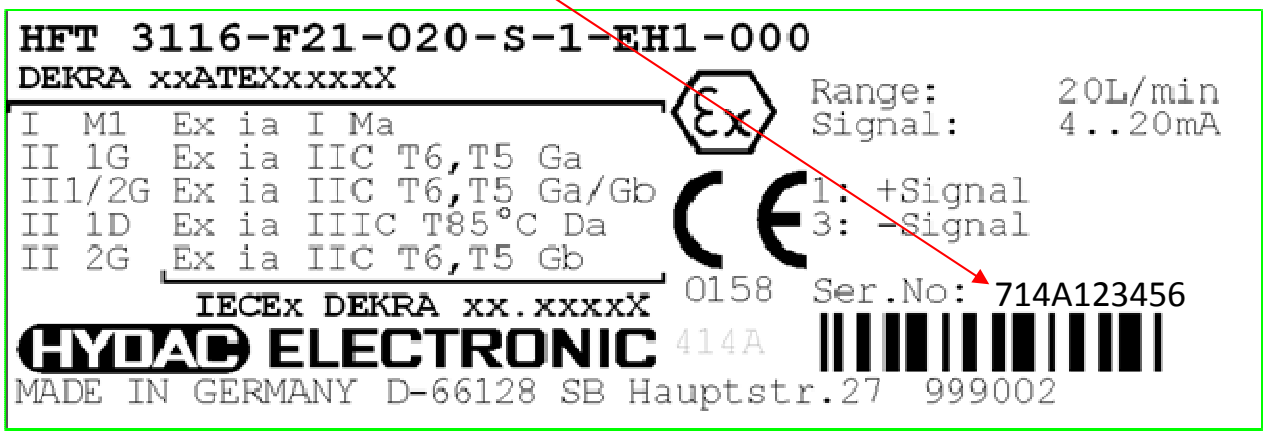
Kennzahl - Typenschlüssel	**1**			**9**	**A**	**C**
ATEX DEKRA 13ATEX0031X DEKRA 13ATEX0032	I M1 Ex ia I Ma	II 1G Ex ia IIC T6,T5 Ga II 1/2G Ex ia IIC T6,T5 Ga/Gb II 1D Ex ia IIIC T85/T95°C Da	II 2G Ex ia IIC T6,T5 Gb	II 3G Ex nA IIC T6,T5 Gc	II 1D Ex ta IIIC T80/T90°C T_{500}90/T_{500}100°C Da II 2D Ex tb IIIC T80/T90°C Db	II 3G Ex ic IIC T6,T5 Gc II 3D Ex ic IIIC T80/T90°C Dc
IECEx DEK 14.0011X	Ex ia I Ma	Ex ia IIC T6,T5 Ga Ex ia IIC T6,T5 Ga/Gb Ex ia IIIC T85/T95°C Da	Ex ia IIC T6,T5 Gb	Ex nA IIC T6,T5 Gc	Ex ta IIIC T80/T90°C T_{500}90/T_{500}100°C Da Ex tb IIIC T80/T90°C Db	Ex ic IIC T6,T5 Gc Ex ic IIIC T80/T90°C Dc
Einsatzgebiete	Bergbau Schutzart: eigensicher ia mit Barriere	Gase leitender Staub Schutzart: eigensicher ia mit Barriere	Gase Schutzart: eigensicher ia mit Barriere	Gase Schutzart: nicht funkend nA	leitender Staub Schutzart: staubgeschütztes Gehäuse	Gase leitender Staub Schutzart: Eigensicher ic mit Barriere

8 Seriennummer

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

Aufbau Seriennummer: xyykzzzzzz

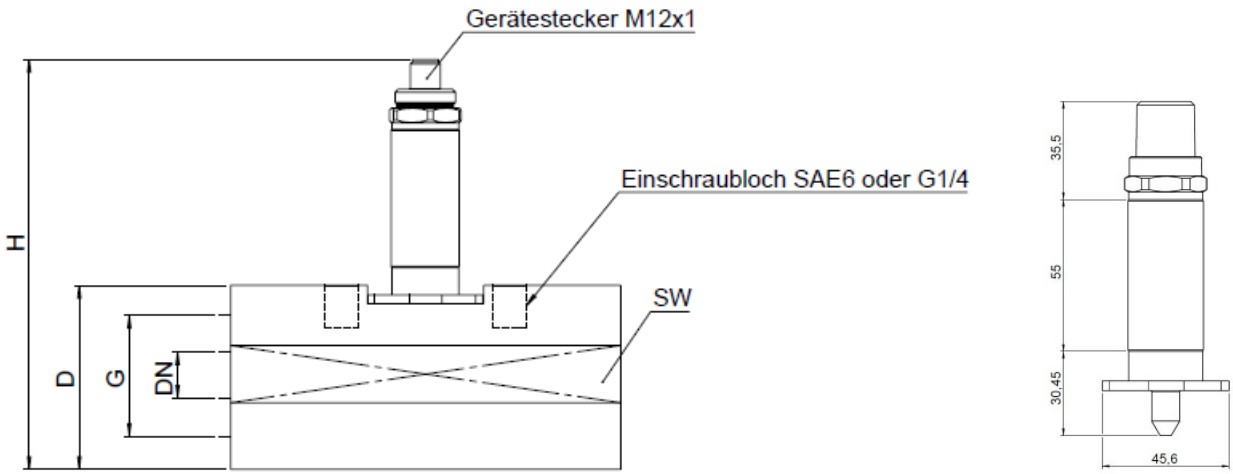
X	Fertigungsjahr	z.B. : 7 → 2017
yy	Kalenderwoche	z.B. : 14→ KW 14
k	Seriennummer-Index	z.B. : -, A, B
zzzzzz	fortlaufende Seriennummer	z.B. : 123456



9 Anschlussbelegung

Die Anschlussbelegung für den elektrischen Anschluss ist sowohl im Kapitel „Kontrollzeichnung“, als auch auf dem Typenschild des Sensors des Volumenstrommessumformers dargestellt.

10 Geräteabmessungen



Ohne Gewindebohrungen für Temperatur- oder Drucksensoren:

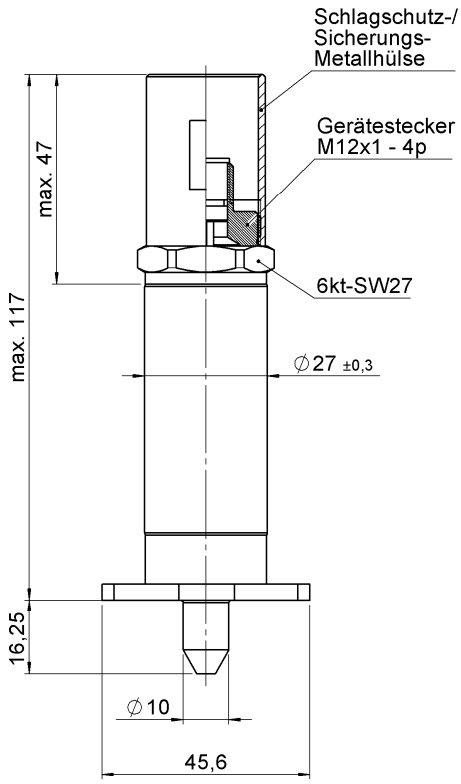
Model	Messbereich	L	H	D / SW	G	Anzugsdrehmoment	DN
HFT 31XX-F21-0020	1,2 .. 20 l/min	117 mm	158 mm	60 / 56 mm	G ¼"	35 Nm	7 mm

Mit Gewindebohrungen für Temperatur- oder Drucksensoren:

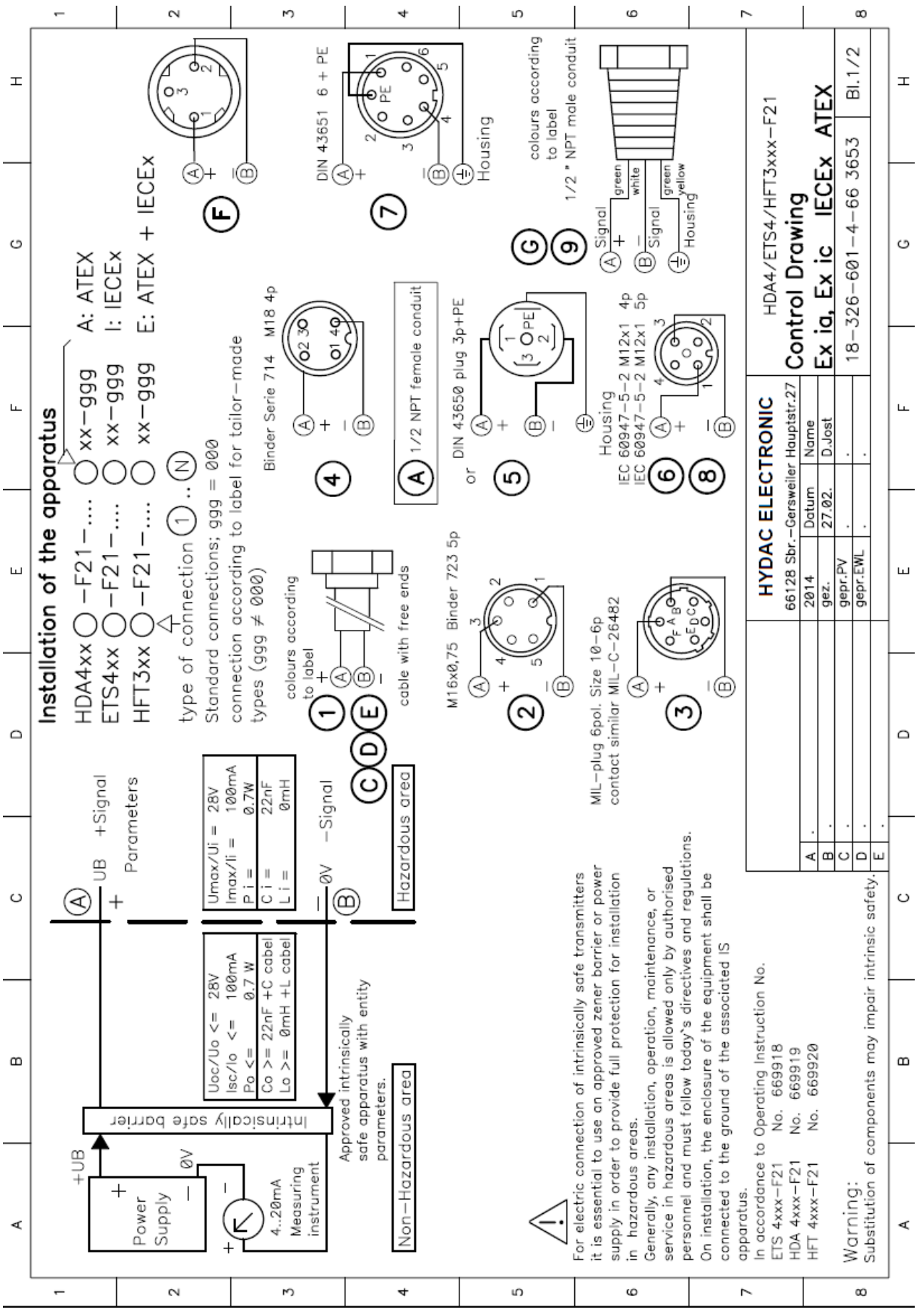
Model	Messbereich	L	H	D / SW	G	Anzugsdrehmoment	DN
HFT 31XX- F21-0060	6 .. 60 l/min	144 mm	160 mm	63 / 60 mm	G ½ "	65 Nm	11 mm
HFT 31XX- F21-0300	15 .. 300 l/min	155 mm	173 mm	75.5 / 72 mm	G 1¼"	240Nm	22 mm
HFT 31XX- F21-0600	40 .. 600 l/min	181mm	178 mm	81 / 76 mm	G 1½ "	290 Nm	30 mm

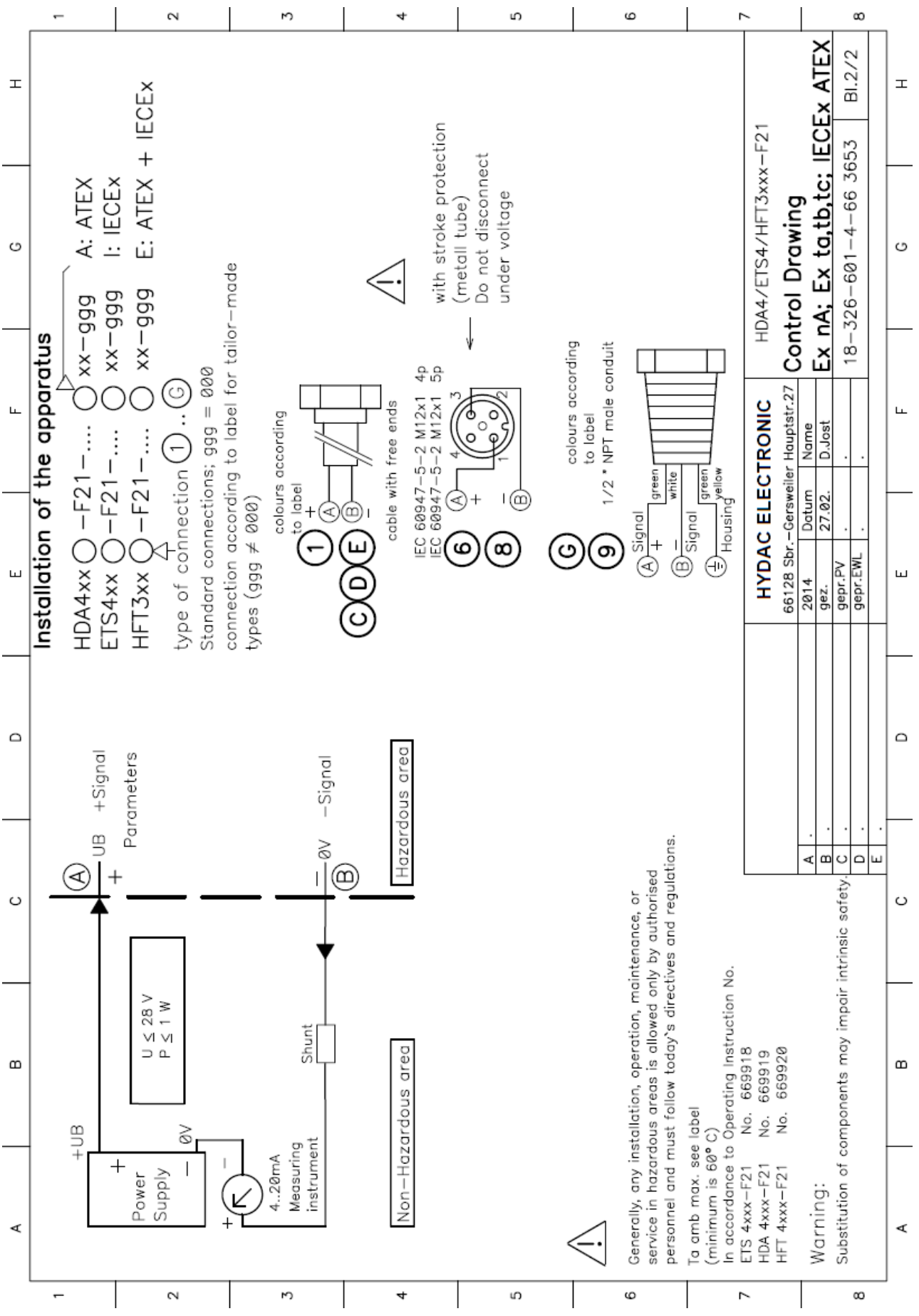
Mit Schlagschutz-Sicherungs-Metallhülse

Schutzklassen und Einsatzgebiete (Kennzahl): 9,A



11 Kontrollzeichnung




Installation of the apparatus
HDA4xx ○ –F21–.... ○ xx–ggg A: ATEX
ETS4xx ○ –F21–.... ○ xx–ggg I: IECEx
HFT3xx ○ –F21–.... ○ xx–ggg E: ATEX + IECEx
type of connection ① .. ⑦
Standard connections; ggg = 000
connection according to label for tailor–made types (ggg ≠ 000)
colours according to label
cable with free ends
IEC 60947–5–2 M12x1 4p
IEC 60947–5–2 M12x1 5p
with stroke protection (metall tube)
Do not disconnect under voltage
colours according to label
1/2 " NPT male conduit
Signal
green
white
green
yellow
Housing
+UB
Power Supply
ØV
4..20mA Measuring instrument
Shunt
UB +Signal
Parameters
U ≤ 28 V
P ≤ 1 W
ØV –Signal
Hazardous area
Non–Hazardous area
Generally, any installation, operation, maintenance, or service in hazardous areas is allowed only by authorised personnel and must follow today's directives and regulations.
Ta amb max. see label (minimum is 60° C)
In accordance to Operating Instruction No.
ETS 4xxx–F21 No. 669918
HDA 4xxx–F21 No. 669919
HFT 4xxx–F21 No. 669920
Warning:
Substitution of components may impair intrinsic safety.
HYDAC ELECTRONIC
66128 Sbr.–Gersweiler Hauptstr.27
HDA4/ETS4/HFT3xxx–F21
Control Drawing
Ex nA; Ex ta,tb,tc; IECEx ATEX
18–326–601–4–66 3653
Bl.2/2
A . 2014 Datum Name
B . gez. 27.02. D.Jost
C . gepr.PV . .
D . gepr.EWL . .
E .

12 Zertifikate

12.1 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	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: *Optional accessory:*	**Pressure and/or Temperature and/or Flow Rate Transmitters Model Series HDA 4..-F21-(...)-...-(...), ETS 4...-F21-(..)-..-(..) and HFT 3..-F21-(...)-...-(...)**	
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:	2014-03-28	

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

DEKRA

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

DEKRA

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 V; I_i = 100 mA; P_i = 0.7 W; C_i = 22 nF; L_i = 0 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 V; P_{max} = 1 W.

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

Form 124
Version 2 (2013-07)

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DEKRA

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

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DEKRA

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 V; I_i = 100 mA; P_i = 0.7 W; C_i = 22 nF; L_i = 0 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 V; P_{max} = 1 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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DEKRA

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

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12.2 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 60079-11 : 2012** **EN 60079-26 : 2007**
EN 60079-31 : 2009 **EN 50303 : 2000**

(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:

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**	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/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 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 and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 28 V; I_i = 100 mA; P_i = 0,7 W; C_i = 22 nF; L_i = 0 mH.

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

Supply/output circuit.(Connection + and -):
U ≤ 28 V; P_{max} = 1 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

Type Examination

(1)

(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 60079-11 : 2012** **EN 60079-15 : 2010**
EN 60079-31 : 2009

(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

Page 1/3

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

(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 data

Apparatus 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 V; I_i = 100 mA; P_i = 0,7 W; C_i = 22 nF; L_i = 0 mH.

Apparatus in types of protection Ex nA and Ex tc

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

13 Konformitätserklärungen

HYDAC ELECTRONIC

HYDAC ELECTRONIC GMBH, Hauptstraße 27, 66128 Saarbrücken

HYDAC ELECTRONIC GMBH

Hauptstraße 27
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Telefon Zentrale 06897 509-01
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Internet: www.hydac.com
siehe dort auch: Allgemeine Geschäftsbedingungen (AGB)

Datum
Ihr Zeichen
Ihre Nachricht
Unser Zeichen

Telefon direkt
Telefax direkt
E-Mail

CE 0158

Betreff

EU-Konformitätserklärung / EC declaration of conformity 18 / 123a / 17

Hiermit erkären 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	Druchflussmesser / Flow rate Transducer
Typ	HFT 31xx-F21-xxxx-S-X-**A/E**xx....
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-6 -1 Okt 07/ -2-März05/ - 3 /4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	2014//34 EU
Normen	EN 60079-0: 2012 ; -11: 2012 ; -26 2007 EN 60079-31: 2009 ; EN 50303: 2000
EG Baumusterprüfbescheinigung / EC -Type Examination Certificate :	DEKRA 13 ATEX 0031X Issue: 2
	DEKRA Certifikation 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 T_{500} 90...110°C Da ; II 1D Ex ia IIIC T85°C or 95°C Da ;
II 2D Ex tb IIIC T80...100°C Db

21.07.2017 ppa. J. Morsch

Datum / Date Name / (CE-Beauftragter) /(CE-authorized person)

630408

HYDAC ELECTRONIC

HYDAC ELECTRONIC GMBH, Hauptstraße 27, 66128 Saarbrücken

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Betreff

CE 0158

EU-Konformitätserklärung / EC declaration of conformity 18 / 124a / 17

Hiermit erkären 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.

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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	Durchflussmesser / Flow rate Transducer
Typ	HFT 31xx-F21-xxxx –S-X- **A/E**xx-....
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-6 -1 Okt 07/ -2-März06/ - 3 /4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	2014//34 EU
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 Certifikation B.V Utrechtseweg 310; NL 6812 AR Arnheim
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

Datum / Date	Name /	(CE-Beauftragter) /(CE-authorized person)
21.07.2017	J. Morsch	

030408

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

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Hauptstr. 27
D-66128 Saarbrücken
Germany

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

Anmerkung

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

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

Technische Änderungen sind vorbehalten.

HYDAC ELECTRONIC

Operating Manual
Flow Rate Transmitter Series HFT 3100
with HART Interface
Intrinsically safe, dustproof enclosure
Non-sparking
ATEX and **IECEx**, dual approval

(Translation of the original operating instructions)

Protection Types and Zones:

ATEX		
DEKRA 13ATEX 0031X	**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**
	II 1D	**Ex ta IIIC T80/90/100°C T_{500} 90/100/110°C Da**
	II 2D	**Ex tb IIIC T80/90/100°C Db**
DEKRA 13ATEX 0032X	**II 3G**	**Ex nA IIC T6, T5, T4 Gc**
	II 3G	**Ex ic IIC T6, T5, T4 Gc**
	II 3D	**Ex tc IIIC T80/90/100°C Dc**
	II 3D	**Ex ic IIIC T80/90/100°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/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	

Table of Contents

1 General

If you have any queries regarding technical details or the suitability of the unit for your application, please contact our **Technical Sales Department**. The series HFT 3100 flow rate 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 Data). However, if there is a cause for complaint, please contact **HYDAC Service**. Interference by anyone other than HYDAC personnel will invalidate all warranty claims as well as the ATEX and IECEx approvials.

2 Function

The flow rate signal measured by the sensor is converted into a proportional analog 4..20 mA signal. In addition to the analoge 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 cable.

3 Installation and Commissioning Information

The transmitter should be mounted inside of a straight piece of piping. Installation directly behind curvatures, branchings or valves should be avoided.

At a required repeatability of 1%, the length of the calming section has to be 10 times the nominal diameter on the flow-in side and 5 times the nominal diameter the outflow side. In order to achieve a repeatability of < 1 %, these sections need to be doubled. In order to avoid mechanical destruction in critical applications (e.g. strong vibrations or knocks), we recommend decoupling the flow rate transmitter by means of flexible hoses.

Flow transmitters with electrical connection ½ NPT Conduit:
If the electrical connection is realized according to the CSA standards by means of a ½ NPT Conduit, flexible conduit connections must be used to allow decoupling in case of vibrations or knocks.

The pipe have to be filled with liquid permanent, air in the system falsify the measurement result.

The piping system should be flushed before installation to avoid solid objects from getting into the turbine. The maximum permissible particle size of dirt contamination may be 0.1 mm for the measuring range 1.2..20 l/min and 0.3mm for the measuring ranges 6..60 l/min, 15..300 l/min and 40..600 l/min. Contamination by fibrous materials must be absolutely avoided. The viscosity of the fluid may not exceed 100 cSt max., as high viscosities may damage the turbine. The turbines were calibrated for a viscosity of 30 cSt. In case of viscosity deviations of more than +/- 5 cSt., non-linear deviations become more and more likely (approx. 2.5 % at +/- 20 cSt).

Connection must 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 flow rate transmitter series HFT 3100 is CE-marked The declaration of conformity can be found in the annex.

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

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 HFT 3100 series, type H (insulation voltage 500 VAC), the cable length to the flow rate transmitter must not exceed 30 m (overvoltage protection to DIN EN 61000-6-2). If the cable length exceeds 30 m, overvoltage protection must be provided by the customer.

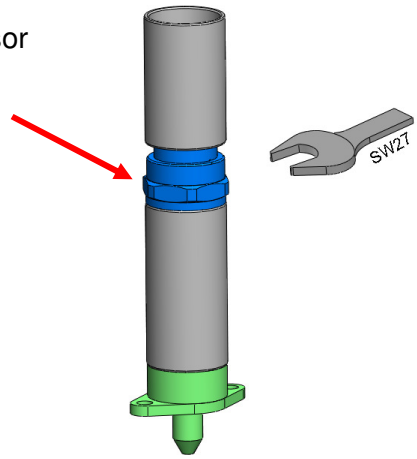
4 Important Mounting Instructions

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

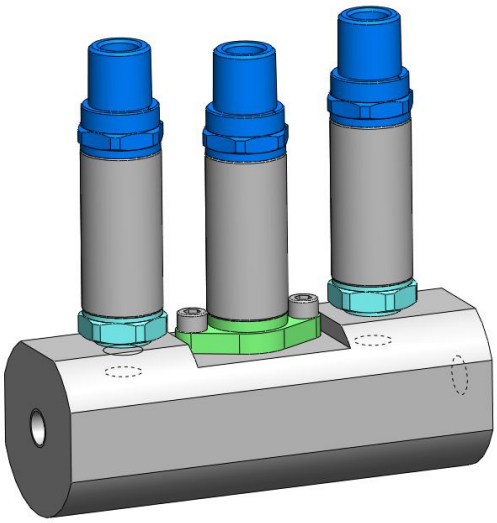
Electrical Installation

The electrical installation may only be carried out utilizing the flats on the 1/2 NPT Conduit (cable outlet).

To be used for fixing the sensor during electrical conduit installation!



Shown with additionally mounted pressure and temperature transmitter:



4.2 Installation Instructions for units with impact protection

Installation instructions for units with M12x1 connector with an impact protection 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 T_{500}90/100°C Da
II 2D Ex tb III C T80/T90°C Db

IECEx

Ex nA IIC T6, T5 Gc

Ex ta IIIC T80/T90°C T_{500}90/100°C Da

Ex tb III C T80/90°C Db

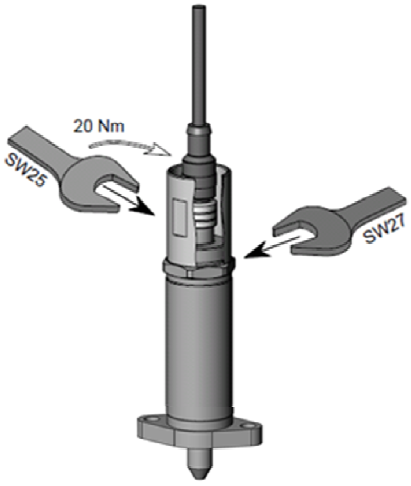
By adherence to safety guidelines in the protection types and applications: the usage of the impact protection metal safety sleeve is stringently required.

The hex. 27 mm flats on the electrical connection side exclusively serves for fixing during the installation of the the impact protection metal safety sleeve.

The connection of the cable with M12x1 plug may only be carried out properly in order to prevent the connection from loosing due to vibrations and it must be carried out in voltage-free condition.

The impact protection metal safety sleeve included in delivery must also be tightened correctly with a torque of 20 Nm.

Also the separation of the M12x1 connector may only be carried out if the system is switched off.



Use the impact protected metal safety sleeve for fixing during installation of the sensor!

5 Safety Information

The flow rate transmitter may no longer be used when the label becomes illegible.
The flow rate transmitters are to be used in general with a suitable intrinsically safe barrier.

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. This check is to be conducted at least every three years.

It is imperative that the measurement fluid is compatible with the materials used in the flow rate transmitter; similarly, the operating pressure must be adhered to without fail (for these specifications, see the “Technical Data” and “Safety Information” of the EC type examination certificate).

The data pertaining to use in a 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 flow rate transmitter must be installed in such a way that it is protected from damage and knocks.
From a safety point of view, the supply / output circuit of flow rate transmitter shall be considered to be connected to earth.

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 T80/90°C T50090/100°C Da und II 2D Ex tb III C T80/90°C Db,
IECEx:
Ex nA IIC T6, T5 Gc / Ex ta IIIC T80/90°C T_{500}90/100°C Da und Ex tb III C T80/90°C Db
the usage of the impact protected/ metal safety sleeve is stringently required.
The impact protected/ metal safety sleeve must be tightened with a torque of 20 Nm.

6 Technical Data
HFT 3100

Input data			
Measuring range and operating pressure			
HFT 31XX- F21-0020	1.2 .. 20.0 l/min 420 bar	0.32 .. 5.28 gpm	6090 psi
HFT 31XX- F21-0060	6.0 .. 60.0 l/min 420 bar	1.59 .. 15.85 gpm	6090 psi
HFT 31XX- F21-0300	15.0 .. 300.0 l/min 420 bar	3.96 .. 79.25 gpm	6090 psi
HFT 311X- F21-0600	40.0 .. 600.0 l/min 420 bar	10.57 .. 158.5 gpm	6090 psi
Mechanical connection (torque value)			
HFT 31XX- F21-0020	$G^{1/4}$ (35 Nm)	1/2 NPT (2.0-3.0 turns)	SAE8 (60 Nm)
HFT 31XX- F21-0060	$G^{1/2}$ (65 Nm)	1/2 NPT (1.5-2.5 turns) 1 NPT (2.0-3.0 turns)	SAE14 (140 Nm)
HFT 31XX- F21-0300	$G1^{1/4}$ (240 Nm)	$1^{1/2}$ NPT (1.5-2.5 turns)	SAE20 (290 Nm)
HFT 31XX- F21-0600	$G1^{1/2}$ (290 Nm)	$1^{1/2}$ NPT (1.5-2.5 turns)	SAE24 (325 Nm)
Additional connection options [1]	2 x G1/4 or 2 x SAE 6 female threads for pressure and/or temperature sensors with the corresponding approval		
Housing material	Stainless steel 1.4404		
Parts in contact with fluid	Stainless steel: 1.4404, 1.4460, tungsten carbide		
Output data			
Output signal, permitted load resistance	4...20 mA, 2 conductor, with HART Protocol $R_{Lmax.}$=(UB - 12 V) / 20 mA [kΩ] With HART communication min. 250 Ω		
	HART communication according to HART 7 specifications		
	HART Common Practice Commands i.e. altering of measuring range limits (see table)		
Accuracy	≤ 2 % of the actual value		
Ambient Conditions			
Operating/ Ambient temperature range	T6, T80/T85°C, T_{500}90°C: Ta = -40 .. 60°C T5, T90/T95°C,T_{500}100°C: Ta = -40 .. 70°C T100, T_{500}110°C : Ta = -40 .. 80 °C T4 Ta = -40 .. 85°C	-40 .. +140 °F -40 .. +158 °F -40 .. +176 °F -40 .. +185°F	
Storage temperature range	-40 .. +100 °C		
Fluid temperature range	T6, T80/T85°C, T_{500}90°C: Ta = -40 .. 60°C T5, T90/T95°C,T_{500}100°C: Ta = -40 .. 70°C T100, T_{500}110°C : Ta = -40 .. 80 °C T4 Ta = -40 .. 85°C	-40 .. +140 °F -40 .. +158 °F -40 .. +176 °F -40 .. +185°F	
CE- Mark	EN 61000-6-1 /-2 / -3 /-4 , EN 60079-0 /11/15/26/ 31, EN 50303		
Vibration resistance to DIN EN 60068-2-6 bei 10 ..500Hz	≤ 10 g		
Protection class acc. DIN EN 60529 [2] Protection class to ISO 20653	IP 67 (M12x1) IP 6K9K (with 1/2 NPT Conduit)		
Relevant data for Ex applications	**Ex ia, ic**	**Ex nA, ta, tb, tc**	
Supply voltage	Ui = 12 .. 28 V DC	12 .. 28 V DC	
Max. input current	Ii = 100 mA		
Maximum input power	Pi = 0.7W	Max. power consuption ≤ 1W	
Connection capacitance of the sensor	C_i = ≤ 22 nF		
Inductance of the sensor	L_i = 0 mH		
Insulation voltage [3]	50 V AC, with integrated overvoltage protection according to EN 61000-6-2 or 500 V AC		
Other data			
Residual ripple of supply voltage	according to FSK Physical Layer Specification (HCF_SPEC_054)		
Current consumption	≤ 25 mA		
Reverse polarity protection of the supply voltage, excess voltage and short circuit	Provided		
Measuring medium	Hydraulic oil, water based fluid		
Viscosity range	1 .. 100 cSt		
Calibration viscosity	30 cSt		
Weight:			
HFT 311X- F21-0020	2.5 kg		
HFT 311X- F21-0060	4.0 kg		
HFT 311X- F21-0300	5.7 kg		
HFT 311X- F21-0600	7.0 kg		

Notes:

[1] Not available for size 1.2 .. 20l/min (0.32 .. 5.28 gpm)

[2] With mounted mating connector in corresponding protection class

[3] see model code for "insulation voltage"

6.1 Measuring Range Limits

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

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

6.2 Protocol Data

HART Version: 7
Manufacturer Code: 0x605E
Manufacturer String: HYDAC ELECTRONIC
Device Type Code: 0xE0FE Variant with flow rate as PV and as the only measured value

7 Model code to identify the delivered part

7.1 Model code

HFT 31 X X - F21 - XXXX - S –X- E X X - 000 (XXX)

Process Connection

1= G ¼“ only for measuring range: 1.2 .. 20 l/min
3 = G ½ “ only for measuring range: 6 .. 60 l/min
6 = G 1 ¼“ only for measuring range: 15 .. 300 l/min
7 = G 1 ½ “ only for measuring range: 40 .. 600 l/min
8 = SAE 8 only for measuring range: 1.2 .. 20 l/min
9 = SAE 14 only for measuring range: 6 .. 60 l/min
A = SAE 20 only for measuring range:15 .. 300 l/min
B = SAE 24 only for measuring range: 40 .. 600 l/min
C = ½ NPT only for measuring range: 1.2 .. 20 l/min, 6 .. 60 l/min
D = 1 NPT only for measuring range: 6 .. 60 l/min
E = 1 ½ only for measuring range: 15 .. 300 l/min, 40 .. 600 l/min
F = Flange, SAE 24 code 62 only for measuring range: 40 .. 600 l/min
G = Flange, SAE 20 code 62 only for measuring range: 15 .. 300 l/min

Electrical connection

6 = Male connector M12X1, 4 pole (female connector not included)
9 = 1/2-14 NPT Conduit (male threads), single leads
G = 1/2-14 NPT Conduit (male thread), jacketed cable

Signal

F21 = 4 .. 20 mA, 2-conductor, with HART Interface

Measuring ranges

0020= 1.2 .. 20 l/min (0.32 .. 5.28 gpm)
0060 = 6 .. 60 l/min (1.59 .. 15.85 gpm)
0300 = 15 .. 300 l/min (3.96 .. 79.25 gpm)
0600 = 40 .. 600 l/min (10.57 .. 158.5 gpm)

Housing material

S = Stainless steel

Housing version

1 = Standard without additional holes (measuring range 0020)
2 = with 2 additional female threads G ¼” ISO 1179-2 (measuring ranges 0060,0300,0600)
3 = with 2 additional female threads SAE 6 (measuring ranges 0060,0300,0600)

Approval

E = ATEX and IECEx (further details, see certificates)

Insulation voltage

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

Protection types and applications: (code)

	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 Only in conjunction with electrical connection "6" and the the the impact protection metal safety sleeve (see device dimensions)	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 Only in conjunction with electrical connection "6" and the the the impact protection metal safety sleeve (see device dimensions)	Ex ta IIIC T80/T90°C Da T_{500}T90/ T_{500}100°C Da Ex tb IIIC T80/T90°C Db
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

Modification Number

000 = Standard

Cable length (e.g. for Conduit connection)

Indications in m or inch

7.2 Evaluation table: Classification of the protection type

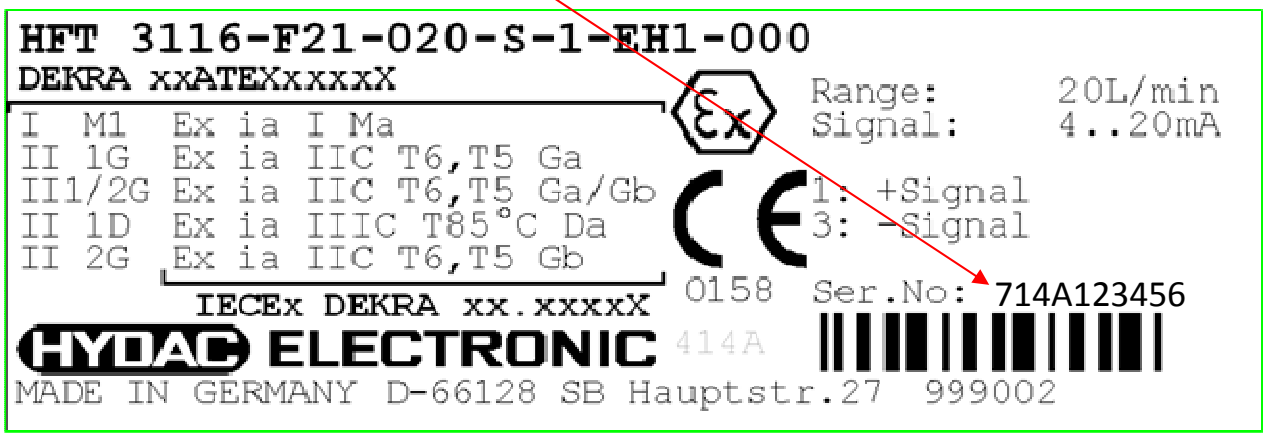
Code no. for use in model code	1			9	A	C
ATEX DEKRA 13ATEX0031X DEKRA 13ATEX0032	I M1 Ex ia I Ma	II 1G Ex ia IIC T6,T5 Ga II 1/2G Ex ia IIC T6,T5 Ga/Gb II 1D Ex ia IIIC T85/T95°C Da	II 2G Ex ia IIC T6,T5 Gb	II 3G Ex nA IIC T6,T5 Gc	II 1D Ex ta IIIC T80/T90°C T_{500}90/T_{500}100°C Da II 2D Ex tb IIIC T80/T90°C Db	II 3G Ex ic IIC T6,T5 Gc II 3D Ex ic IIIC T80/T90°C Dc
IECEx DEK 14.0011X	Ex ia I Ma	Ex ia IIC T6,T5 Ga Ex ia IIC T6,T5 Ga/Gb Ex ia IIIC T85/T95°C Da	Ex ia IIC T6,T5 Gb	Ex nA IIC T6,T5 Gc	Ex ta IIIC T80/T90°C T_{500}90/T_{500}100°C Da Ex tb IIIC T80/T90°C Db	Ex ic IIC T6,T5 Gc Ex ic IIIC T80/T90°C Dc
Application areas	Mining Protection class: Intrinsically safe ia with barrier	Gases conductive dust Protection class: Intrinsically safe ia with barrier	Gases Protection class: Intrinsically safe ia with barrier	Gases Protection class: Non-sparking nA	Conductive dust Protection class: Dustproof enclosure	Gases Conductive dust Protection class: Intrinsically safe ic with barrier

8 Serial number

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

Configuration of serial number (SN): xyykzzzzzz

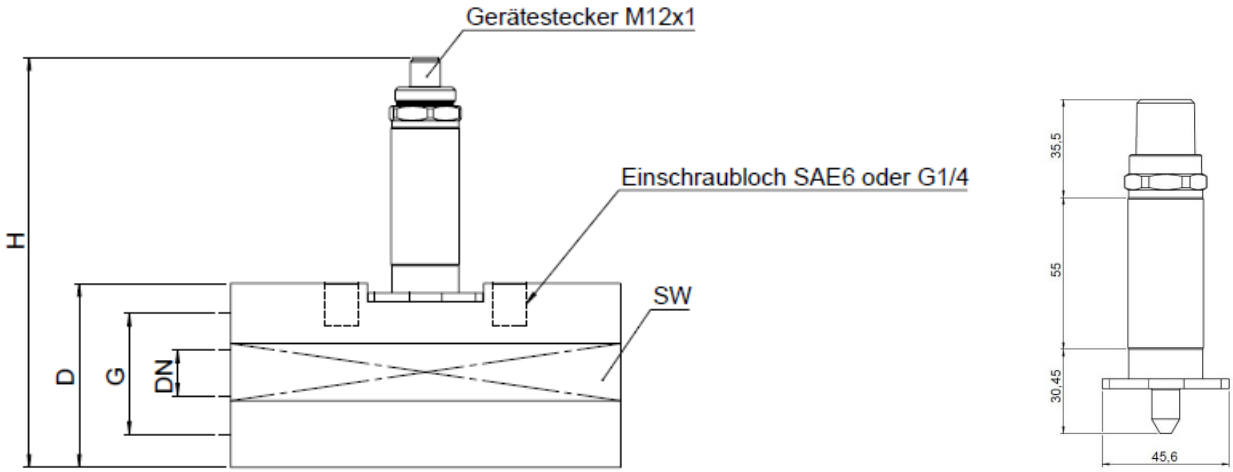
XX	Manufacturing year	e.g. : 7 → 2017
yy	Calendar week	e.g. : 14→ CW 14
k	Change control status	e.g. : A : -, A, B
zzzzzz	Sequential serial number	e.g. : 123456



9 PIN assignment

The pin assignment for the electrical connection is shown in the chapter "Control Drawing" as well as on the type label of the flow rate transmitter.

10 Dimensions



Without threaded holes for temperature and pressure sensors:

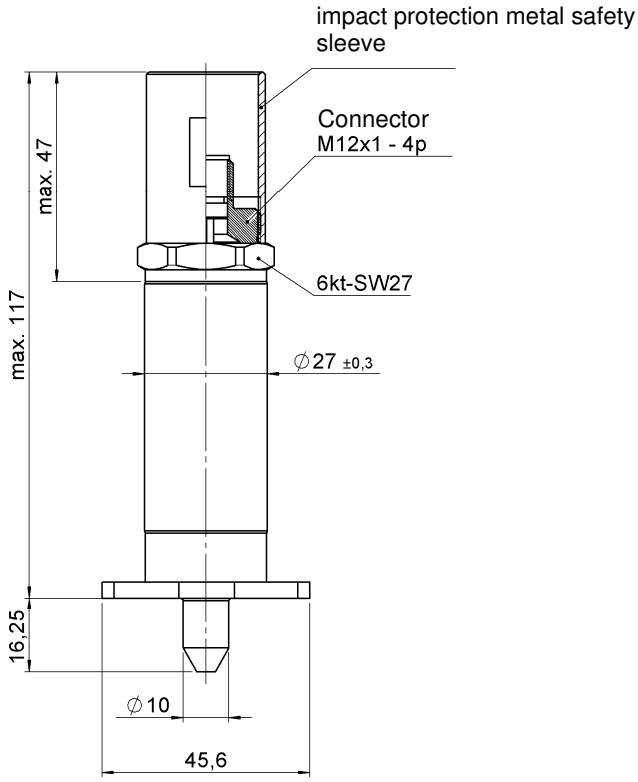
Model	Measurement range	L	H	D / SW	G	Tightening torque	DN
HFT 31XX-F21-0020	1.2 .. 20 l/min	117 mm	158 mm	60 / 56 mm	G ¼"	35 Nm	7 mm

With threaded holes for temperature and pressure sensors:

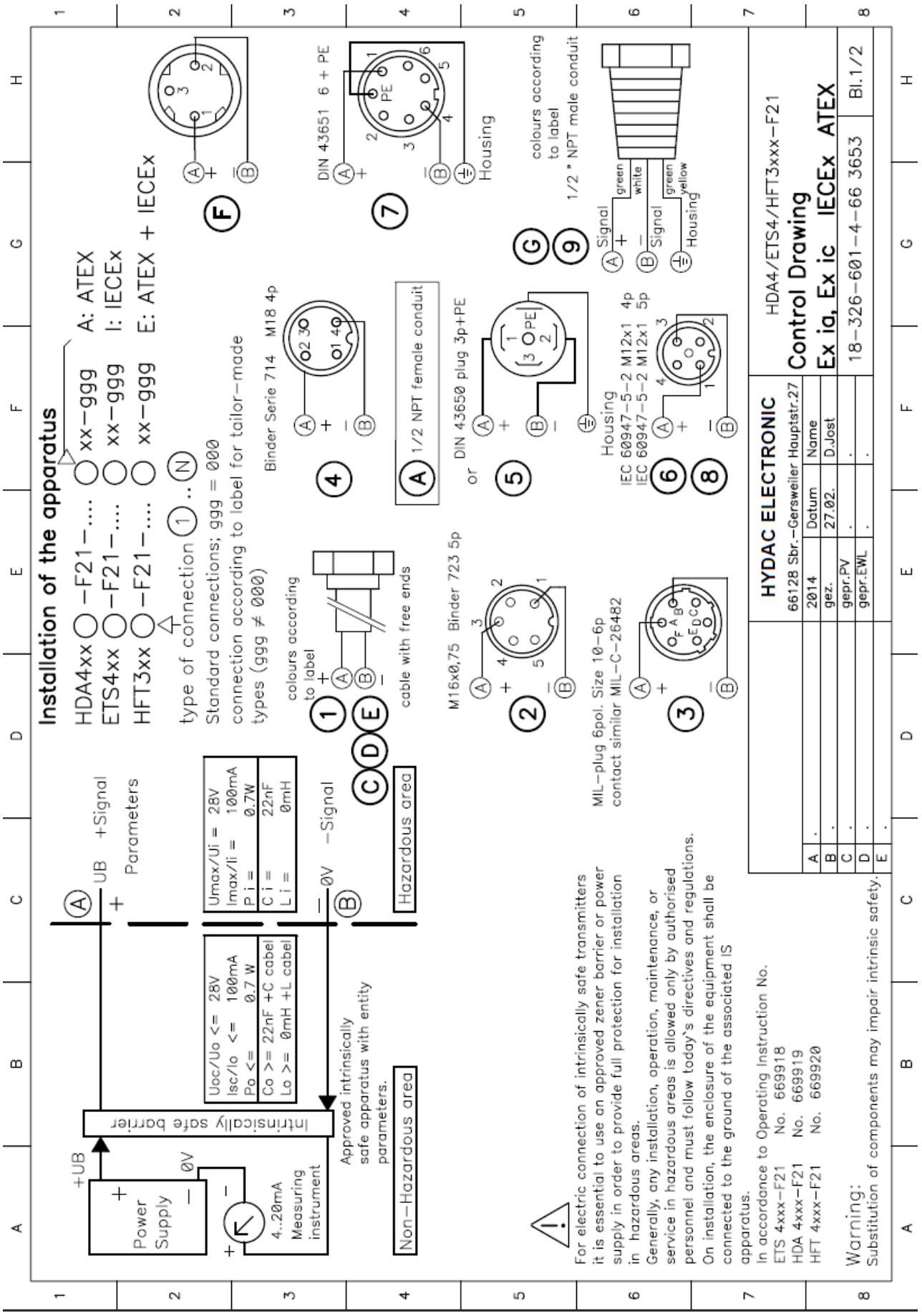
Model	Measurement range	L	H	D / SW	G	Tightening torque	DN
HFT 31XX- F21-0060	6 .. 60 l/min	144 mm	160 mm	63 / 60 mm	G ½ "	65 Nm	11 mm
HFT 31XX- F21-0300	15 .. 300 l/min	155 mm	173 mm	75.5 / 72 mm	G 1¼"	240 Nm	22 mm
HFT 31XX- F21-0600	40 .. 600 l/min	181mm	178 mm	81 / 76 mm	G 1½ "	290 Nm	30 mm

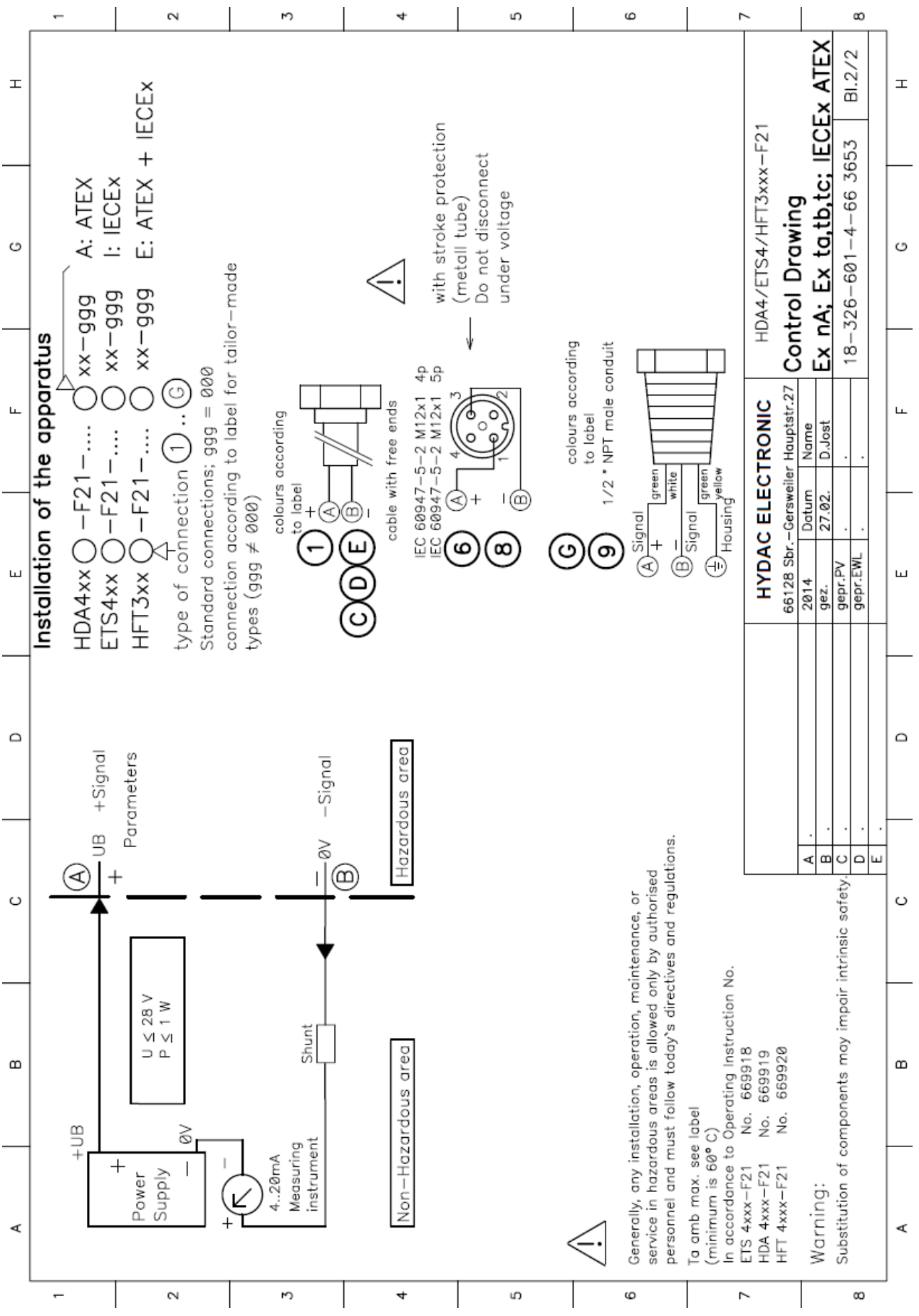
With impact protection metal safety sleeve

Protection types and applications: (code): 9, A



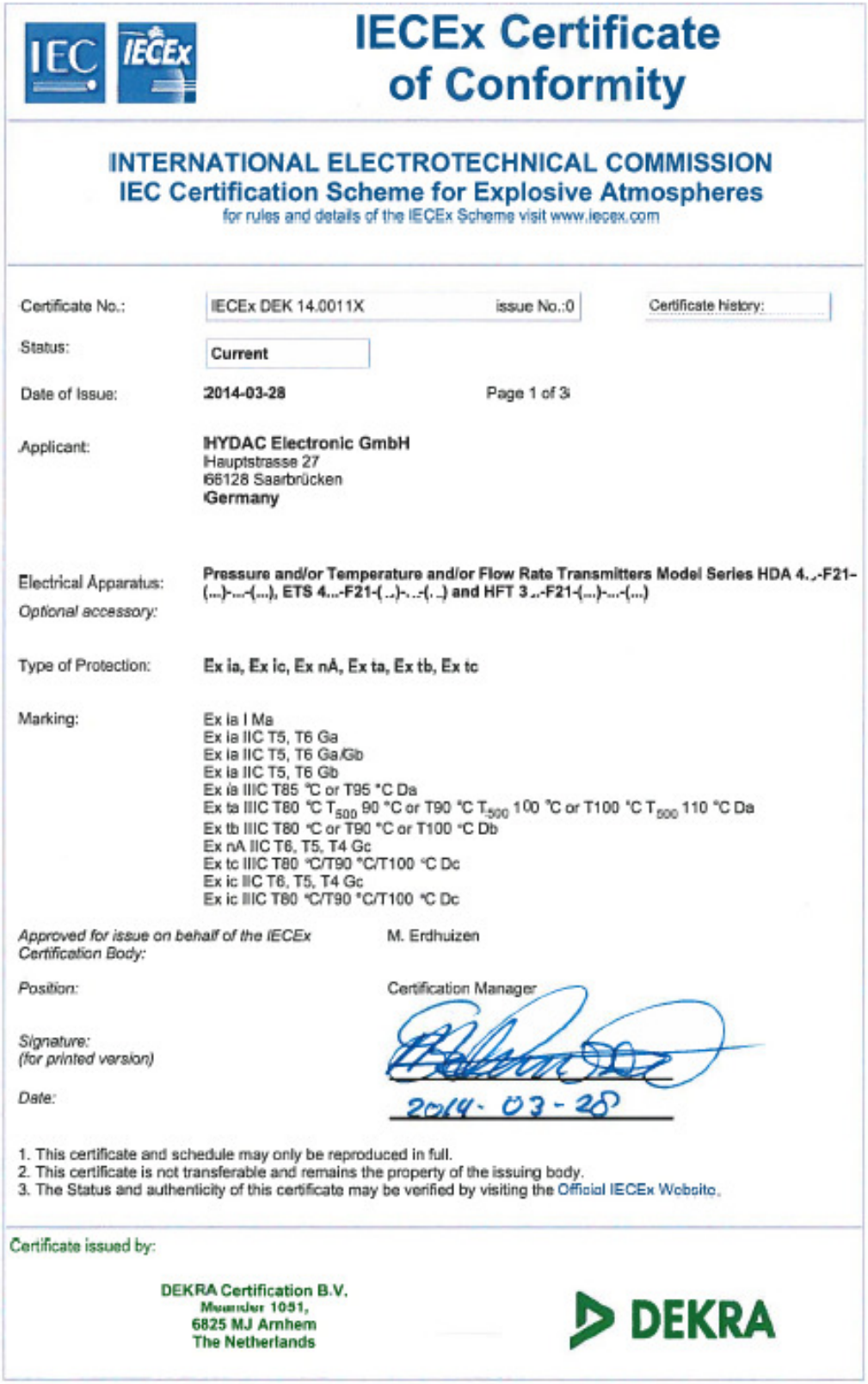
11 Control Drawing




Installation of the apparatus
HDA4xx ○ −F21−.... ○ xx−ggg A: ATEX
ETS4xx ○ −F21−.... ○ xx−ggg I: IECEx
HFT3xx ○ −F21−.... ○ xx−ggg E: ATEX + IECEx
type of connection ① .. ⑦
Standard connections; ggg = 000
connection according to label for tailor−made types (ggg ≠ 000)
colours according to label
cable with free ends
IEC 60947−5−2 M12x1 4p
IEC 60947−5−2 M12x1 5p
with stroke protection (metall tube)
Do not disconnect under voltage
colours according to label
1/2 " NPT male conduit
Signal
Housing
green
white
yellow
+UB
Power Supply
ØV
4..20mA Measuring instrument
U ≤ 28 V
P ≤ 1 W
UB +Signal
Parameters
Shunt
ØV −Signal
Hazardous area
Non−Hazardous area
Generally, any installation, operation, maintenance, or service in hazardous areas is allowed only by authorised personnel and must follow today's directives and regulations.
Ta amb max. see label (minimum is 60° C)
In accordance to Operating Instruction No.
ETS 4xxx−F21 No. 669918
HDA 4xxx−F21 No. 669919
HFT 4xxx−F21 No. 669920
Warning:
Substitution of components may impair intrinsic safety.
HYDAC ELECTRONIC
66128 Sbr.−Gersweiler Hauptstr.27
HDA4/ETS4/HFT3xxx−F21
Control Drawing
Ex nA; Ex ta,tb,tc; IECEx ATEX
18−326−601−4−66 3653
Bl.2/2
2014 Datum Name
gez. 27.02. D.Jost
gepr.PV . .
gepr.EWL . .

12 Certificates

12.1 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 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: 2014-03-28

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

DEKRA

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

DEKRA

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 V; I_i = 100 mA; P_i = 0.7 W; C_i = 22 nF; L_i = 0 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 V; P_{max} = 1 W.

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

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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DEKRA

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

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DEKRA

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 V; I_i = 100 mA; P_i = 0.7 W; C_i = 22 nF; L_i = 0 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 ≤ 28 V; P_{max} = 1 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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DEKRA

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

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12.2 ATEX

CERTIFICATE

EC-Type Examination

(1)

(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 60079-11 : 2012** **EN 60079-26 : 2007**
EN 60079-31 : 2009 **EN 50303 : 2000**

(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:

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**	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/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

(13) # SCHEDULE

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

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 and Ex ia IIIC, only for connection to a certified intrinsically safe circuit, with the following maximum values:
U_i = 28 V; I_i = 100 mA; P_i = 0,7 W; C_i = 22 nF; L_i = 0 mH.

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

Supply/output circuit.(Connection + and -):
U ≤ 28 V; P_{max} = 1 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

Type Examination

(1)

(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 60079-11 : 2012** **EN 60079-15 : 2010**
EN 60079-31 : 2009

(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

Page 1/3

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DEKRA

(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 data

Apparatus 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 V; I_i = 100 mA; P_i = 0,7 W; C_i = 22 nF; L_i = 0 mH.

Apparatus in types of protection Ex nA and Ex tc

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

13 EC declarations of conformity

HYDAC ELECTRONIC

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

Datum
Ihr Zeichen
Ihre Nachricht
Unser Zeichen

Telefon direkt
Telefax direkt
E-Mail

CE 0158

Betreff

EU-Konformitätserklärung / EC declaration of conformity 18 / 123a / 17

Hiermit erkären 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	Druchflussmesser / Flow rate Transducer
Typ	HFT 31xx-F21-xxxx-S-X-**A/E**xx....
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-6 -1 Okt 07/ -2-März05/ - 3 /4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	2014//34 EU
Normen	EN 60079-0: 2012 ; -11: 2012 ; -26 2007 EN 60079-31: 2009 ; EN 50303: 2000
EG Baumusterprüfbescheinigung / EC -Type Examination Certificate :	DEKRA 13 ATEX 0031X Issue: 2
	DEKRA Certifikation 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 T_{500} 90...110°C Da ; II 1D Ex ia IIIC T85°C or 95°C Da ;
II 2D Ex tb IIIC T80...100°C Db

21.07.2017 ppa. J. Morsch

Datum / Date Name / (CE-Baumusterprüfer) / (CE-authorized person)

630408

HYDAC ELECTRONIC

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Betreff

CE 0158

EU-Konformitätserklärung / EC declaration of conformity 18 / 124a / 17

Hiermit erkären 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	Durchflussmesser / Flow rate Transducer
Typ	HFT 31xx-F21-xxxx –S-X- **A/E**xx-....
EMV Richtlinie / EMC Guideline	2014/ 30
Normen	DIN EN 61000-6 -1 Okt 07/ -2-März06/ - 3 /4 Sept 11
Geräte für explosionsgefährdete Bereiche / Equipment for use in potentially explosive atmospheres	2014//34 EU
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 Certifikation B.V Utrechtseweg 310; NL 6812 AR Arnheim
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

21.07.2017 J. Morsch

Datum / Date Name / (CE-Beauftragter) /(CE-authorized person)

030405

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

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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.

Subject to technical modifications.