



Member of the FM Global Group

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CERTIFICATE OF COMPLIANCE

HAZARDOUS (CLASSIFIED) LOCATION ELECTRICAL EQUIPMENT

This certificate is issued for the following equipment:

Electropneumatic Positioner SIPART PS2

6DR5a*b-0cdef-gh-Z***.**

IS / I,II,III / 1 / ABCDEFG / T4 Ta= -30°C to +80°C; T6 Ta = -30°C to +50°C– A5E0065622D;
Entity; FISCO

I / 1 / AEx ib / IIC / T4 Ta= -30°C to 80°C; T6 Ta = -30°C to +50°C– A5E0065622D; Entity;
FISCO

DIP / II, III / 1 / EFG / T4 Ta= -30°C to +80°C; T6 Ta = -30°C to +50°C – A5E0065622D*

21 / AEx tb / IIIC / T100°C Ta = -30°C to +80°C– A5E0065622D*

NI / I / 2 / ABCD / T4 Ta= -30°C to +80°C; T6 Ta= -30°C to +50°C– A5E0065622D*

I / 2 / AEx nA / IIC / T4 Ta=-30°C to +80°C; T6 Ta= -30°C to +50°C– A5E0065622D*

Type 4X; IP20; IP54; IP66

Entity Parameters – Refer to Control Drawing A5E0065622D

*Not all listing codes allowed for every model. See drawing A5E0065622D for actual product listing code variations.

a= electronics: 0 ,2 ,5 , or 6

b= enclosure: 0, 1, 2, or 3

c= explosion protection: E, G, D, F, K or N

d= connection thread electrical / pneumatic: G, N, M, P, R, or S

e= limit monitor: 0, 1, 2, or 3

f= option modules: 0, 1, 2, or 3

g= customer specific design: 0, 2, 6, 7, or 8

h= mounted pressure gauge block: 0, 1, 2, 3, 4, 9 R**

*= Alpha Numeric options not affecting safety

Special Conditions of Use:

1) *Acceptable for use with air or natural gas.*

6DR4004-6Na*0-*. Non Contacting Position Sensor.**

IS / I / 1 / ABCD / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L; Entity;
I / 1 / AEx ib IIC / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L; Entity;
NI / I / 2 / ABCD / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L;
NI / I / 2 / IIC / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L; Type 4X

Entity/Nonincendive Field Wiring Parameters:
Refer to Control Drawing A5E0065622D

a = Cable length N, P, or R.
*= Alpha Numeric options not affecting safety

Electro pneumatic Positioner Sitrans VP160.

6DR64a0-*bcde-*f-Z***.**

IS / I,II,III / 1 / ABCDEFG / T4 Ta=-30°C to +80°C; T6 Ta = -30°C to +50°C– A5E0065622D;
Entity; FISCO
I / 1 / AEx ib / IIC / T4 Ta=-30°C to 80°C; T6 Ta = -30°C to +50°C– A5E0065622D; Entity;
FISCO
DIP / II, III / 1 / EFG / T4 Ta= -30°C to +80°C; T6 Ta = -30°C to +50°C – A5E0065622D*
21 / AEx tb / IIIC / T100°C Ta = -30°C to +80°C– A5E0065622D*
NI / I / 2 / ABCD / T4 Ta=-30°C to +80°C; T6 Ta=-30°C to +50°C– A5E0065622D*
I / 2 / AEx nA / IIC / T4 Ta=-30°C to +80°C; T6 Ta=-30°C to +50°C– A5E0065622D*
Type 4X; IP20; IP54; IP66

Entity Parameters – Refer to Control Drawing A5E0065622D
*Not all listing codes allowed for every model. See drawing A5E0065622D for actual product listing code variations.

a= version : 0 or 2
b= explosion protection zone : D, E, F, G, K or N
c= explosion protection authority : B, S
d= connection thread electrical / pneumatic : 0, 1, 2 or 3
e= option modules : 0 or 1
f= mounted pressure gauge block : 0, 1, 2, 3, 4 or 9 R**
*= Alpha Numeric options not affecting safety

Special Conditions of Use:

1) Acceptable for use with air or natural gas.

6DR4004-6Na*0-*. Non Contacting Position Sensor.**

IS / I / 1 / ABCD / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L; Entity;
I / 1 / AEx ib IIC / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L; Entity;
NI / I / 2 / ABCD / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L;
NI / I / 2 / IIC / T6 Ta = 70°C; T4 Ta = 85°C - A5E00078040L; Type 4X

Entity/Nonincendive Field Wiring Parameters:
Refer to Control Drawing A5E0065622D

a = Cable length N, P, or R.
*= Alpha Numeric options not affecting safety



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Equipment Ratings:

Intrinsically Safe for Class I, II, III Division 1, Groups A, B, C, D, E, F, and G hazardous (classified) locations in accordance with drawing A5E0065622D, Intrinsically Safe for Class I, Zone 1, Group IIC hazardous (classified) locations in accordance with drawing A5E0065622D; Dust Ignition Proof for use in Class II, III Division 1, Groups E, F, G hazardous (classified) locations in accordance with drawing A5E0065622D; Dust Ignition Protection by Enclosure for use in Zone 21, Group IIIC; Nonincendive for use in Class I, Division 2, Groups A, B, C and D and Class I, Zone 2, Group IIC; Non-Sparking for Class I, Zone 2, Group IIC; indoor and outdoor, Type 4X, IP20, IP54 and IP66 Hazardous (Classified) Locations.

FM Approved for:

Siemens AG - I IA SC
Karlsruhe, Germany



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This certifies that the equipment described has been found to comply with the following Approval Standards and other documents:

Class 3600	2011
Class 3610	2010
Class 3611	2004
Class 3810	2005
Class 3616	2011
ANSI/NEMA 250	1991
ANSI/IEC 60529	2001
ANSI/ISA 60079-0	2009
ANSI/ISA 60079-15	2009
ANSI/ISA 60079-31	2009

Original Project ID: 3010184

Approval Granted: August 29, 2001

Subsequent Revision Reports / Date Approval Amended

Report Number	Date	Report Number	Date
3013969	October 18, 2002		
3016206	February 28, 2003		
3017666	September 25, 2003		
3029375	January 8, 2008		
081029	June 18, 2009		
110311	October 14, 2011		
3041945	May 24, 2012		
3051178	September 29, 2014		

FM Approvals LLC

J.E. Marquedant
Manager, Electrical Systems

29 September 2014

Date

SIEMENS

Positioners

Electropneumatic positioners

Control Drawing

Edition

03/2014

Answers for industry.

1.0 Description

1.1 Electropneumatic Positioner (SIPART PS2) / (SITRANS VP160)

The SIPART PS2 / SITRANS VP 160 explosion proof electropneumatic positioner serves as a coupling module between closed-loop controller and pneumatic actuators.

Together with the pneumatic actuator, it forms a control-loop in which the actual value x is the position of the drive rod with linear actuators or the position of the drive shaft with part-turn actuators and the command variable is the positioning current of a closed-loop controller or manual control station of 0/4 to 20 mA. By comparison between the set point and actual value, the microcontroller generates pneumatic positioning increments $\pm \Delta y$ which are applied to the actuator via piezo-precontrolled valves.

The actuator volume integrates the positioning increments into the positioning pressure y which moves the drive rod or shaft approximately proportionally. The pneumatic actuators are available in single-acting and double-acting versions.

In the case of the single-acting version, only one volume is aerated and vented; the resulting pressure works against a spring. In the case of the double-acting version, two volumes work against each other; when one volume is aerated, the other is vented.

The following devices are suitable for potentially explosive atmosphere resp. indoor or outdoor use

<i>SIPART PS2</i>	<i>6DR5ayb-.cdef-g.Ah-Z...</i>
<i>SITRANS VP160</i>	<i>6DR64a0-bcdef-0AAg-Z...</i>

with the datas (c = E, D, F, G, K)

1.2 Non Contacting Sensor (NCS)

The **Non Contacting Position Sensor (NCS)** is a sensor to detect valve and flap positions for the electropneumatic positioner SIPART PS2. The NCS and electropneumatic positioner SIPART PS2 can be mounted separately in all housing variants.

The electropneumatic positioner SIPART PS2 can then be mounted at some distance on a mounting tube or similar and is connected to the NCS by an electric cable. The NCS consists of a potted sensor and a magnet. The magnet is mounted directly on the spindle in linear actuators or on the drive shaft in part-turn actuators

1.3 External Position Detection System (EPDS)

The positioner facilitates the separate installation of a position detection system, e. g. C73451-A430-D78. The stroke or rotary angle is recorded directly at the drive by means of an external position detection system. It is therefore possible to install the control unit at some distance away, e.g. on an assembly pipe or similar. The positioner is wired to the position detection system by means of electrical cable.

The positioner is connected to the drive via one or two pneumatic lines.

Such a separate installation is useful whenever the ambient conditions at the fitting exceed the specified positioner values. The external position detection system is mounted onto the console on part-turn actuators and to a bracket on linear actuators.

The bracket can be a NAMUR type, or any other mounting bracket

2.0 Option modules

The basic device can be equipped or retrofitted with the following different modules:

Positioner SIPART PS2		
Designation	Type no.	Type code
(1) Alarm module	6DR4004-6A / 6DR4004-7A	g= 1
(2) SIA modul (Slot initiators)	6DR4004-6G	g=2
(3) Mechanical limit switch module	6DR4004-6K	g=3
(4) Position feedback module	6DR4004-6J / 6DR4004-7J	h=1 resp. h=3
(5) EMC filter module	C73451-A430-D23	h=1 resp. h=3
(6) External position detection system	C73451-A430-D78	not attached with the type code of basic device
(7) Non contacting sensor (NCS)	6DR4004-6N..0-...	
Positioner SITRANS VP160		
Designation	Type no.	Type code
(4) Position feedback module	6DR4004-6J / 6DR4004-7J	f=1

- (1) The alarm module provides 3 binary outputs and one binary input. The binary outputs can be used to monitor the manipulated variable for 2 limits as well as the microcontroller including its position control function for faults.
- (2) The SIA module provides 3 binary outputs. In addition to monitoring the microcontroller with its position control function for faults, it is possible to monitor the valve position using 2 slot initiators even in the case of a device failure.
- (4) The manipulated variable y (valve position) can be output as a current (4 - 20 mA) by means of the position feedback module.
- (5) The EMC filter module is intend to connecting an external position detection system e.g. C74451-A430-D78 (6) or Non contacting sensor 6DR4004-6N..0-... (7) for position feedback.

The alarm (1) or SIA module (2) or EMC filter module (5) are intended to installed into the same slot. Therefore, the device can only be equipped with one of these modules.

3.0 Designation code

Positioner SIPART PS2:

6DR5ayb-0cdef-g..h-Z...

a = 0, 2, 5 or 6
 y = 1, 2, 3 or 4
 b = 0, 1, 2 or 3
 c = E, G, D, F or K
 d = G, N, M, P, R or S
 e = 1, 2, or 3
 f = 1, 2, or 3
 g = 0, 2, 6, 7 or 8
 h = 0, 1, 2, 3, 4 or 9R..

. = any character

Positioner SITRANS VP160

6DR64a0-bcdef-0AAg-Z...

a = 0, or 2
 b = 1, or 2
 c = E, G, D, F or K
 d = S or A
 e = 1, 2, or 3
 f = 0 or 1
 g = 0, 1, 2, 3, 4 or 9R..

4.0 Max. permissible ambient temperatures

- **Intrinsic safety (IS)**
- **Non incentive (NI)**

Type designation	T4	T6
<u>SIPART PS2 with and without HART</u> 6DR5ayb-.cdef-g.Ah—Z... with the data a = 0, 2 <u>SITRANS VP160</u> 6DR64a0-bcdef-0AAg-Z... with the data a = 0, 2	-30 °C to +80 °C	-30 °C to +50 °C
<u>SIPART PS2 PA/FF</u> 6DR5ayb-.cdef-g.Ah—Z... with the data a = 5, 6	-20 °C to +75 °C	-20 °C to +50 °C
<u>SIPART PS2 with and without HART</u> 6DR5ayb-.cdef-g.Ah-Z... with the data y = 3	-20 °C to +60 °C	-20 °C to +50 °C
<u>SIPART PS2 PA/FF</u> 6DR5ayb-.cdef-g.Ah—Z... with the data y = 3	-20 °C to +60 °C	-20 °C to +50 °C
<u>SIPART PS2 incl. Position feedback module</u> 6DR5ayb-.cdef-g.Ah-Z... with the data f = 1, 3 <u>Option: Position feedback module to retrofit into SIPART PS2</u> 6DR4004-6J / 6DR4004-7J	Only permissible for T4! a = 0, 2 -30 °C to +80 °C a = 5, 6 -20 °C to +75 °C	-
<u>SITRANS VP160 incl. Position feedback module</u> 6DR64a0-bcdef-0AAg-Z... with the data f = 1 <u>Position feedback module to retrofit into SITRANS VP160</u> 6DR4004-6J / 6DR4004-7J	Only permissible for T4! -30 °C to +80 °C	
<u>Option: Non contacting sensor (NCS)</u> 6DR4004-6N..0-...	-40 °C to +90 °C	-40 °C to +70 °C
<u>Option: External position detection system</u> C73451-A430-D78	-40 °C to +90 °C	-40 °C to +60 °C

➤ **Dust ignition proof (DIP)**

Type designation	Max.ambient temperatures
SIPART PS2 with and without HART 6DR5ayb-.cdef-g.Ah-Z... With the datas a = 0, 2; c = D, K SITRANS VP160 6DR64a0-bcdef-0AAg-Z... with the datas a = 0, 2; c = D, K	-30 °C...+80 °C
SIPART PS2 PA/FF 6DR5ayb-.cdef-g.Ah-Z... with the datas a = 5, 6; c = D, K	-20 °C...+75 °C
SIPART PS2 incl. Position feedback module 6DR5ayb-.cdef-g.Ah-Z... with the datas f = 1, 3; c = D, K Position feedback module to retrofit into SIPART PS2 6DR4004-6J / 6DR4004-7J	If a = 0, 2 then (-30 °C...+80 °C) If a = 5, 6 then (-20 °C...+75 °C)
SITRANS VP160 incl. Position feedback module 6DR64a0-bcdef-0AAg-Z... with the datas f = 1; c = D, K Position feedback module to retrofit into SITRANS VP160 6DR4004-6J / 6DR4004-7J	-30 °C...+80 °C
SIPART PS2 6DR5ayb-.cdef-g.Ah—Z... with the datas y = 3	-20 °C...+60 °C

5.0 Explosion protection

SIPART PS2 6DR5ayb-.cdef-g.Ah—Z... SITRANS VP160 6DR64a0-bcdef-0AAg-Z... with the datas: c = E	IS, Class I, II, III, Division 1, Group ABCDEFG IS, Class I, Zone 1, (A)Ex ib, IIC, T6/T4
SIPART PS2 6DR5ayb-.cdef-g.Ah—Z... SITRANS VP160 6DR64a0-bcdef-0AAg-Z... with the datas: c = G	NI, Class I, Division 2, Group ABCD NI, Class I, Zone 2, (A)Ex nA, IIC, T6/T4
SIPART PS2 6DR5ayb-.cdef-g.Ah—Z... with the datas: b = 1, 2, 3; c = D SITRANS VP160 6DR64a0-bcdef-0AAg-Z... with the datas: c = D	NI, Class I, Division 2, Group ABCD NI, Class I, Zone 2, (A)Ex nA, IIC, T6/T4 DIP, Class II, III, Division 1, Group EFG DIP, Class II, III, Zone 21, (A)Ex t, IIIC, T100°C
SIPART PS2 6DR5ayb-.cdef-g.Ah—Z... with the datas: b = 1, 2, 3; c = K SITRANS VP160 6DR64a0-bcdef-0AAg-Z... with the datas: c = K	IS, Class I, II, III, Division 1, Group ABCDEFG IS, Class I, Zone 1, (A)Ex ib, IIC, T6/T4 NI, Class I, Division 2, Group ABCD NI, Class I, Zone 2, (A)Ex nA, IIC, T6/T4 DIP, Class II, III, Division 1, Group EFG DIP, Class II, III, Zone 21, (A)Ex t, IIIC, T100°C
SIPART PS2 6DR5ayb-.cdef-g.Ah—Z... SITRANS VP160 6DR64a0-bcdef-0AAg-Z... with the datas: c = F External position detection system C73451-A430-D78 Non Contacting Sensor (NCS) 6DR4004-6N..0-...	IS, Class I, II, III, Division 1, Group ABCDEFG IS, Class I, Zone 1, (A)Ex ib, IIC, T6/T4 NI, Class I, Division 2, Group ABCD NI, Class I, Zone 2, (A)Ex nA, IIC, T6/T4

6.0 Safety Notes

- 6.1 Approved associated apparatus or approved barrier must be installed in accordance with manufacturer instructions.
- 6.2 Approved associated apparatus or approved barrier must meet the following requirements:
- Vo < Vi max.
 - Io < Ii max.
 - Po < Pi max.
 - Ca > Ci+Ccable
 - La > Li+Lcable
- 6.3 The maximum non-hazardous area voltage must not exceed 250 V.
- 6.4 The installation must be in accordance with the National Electrical Code NFPA 70, Article 504, 505, and ANSI/ISA-Rp 12.6.
- 6.5 The cable shield must be connected to earth potential in accordance with ANSI/ISA-Rp. 12.6.
- 6.6 Use only supply wires suitable for 20°C above surrounding temperature.
- 6.7 Substitution of components may impair intrinsic safety.
- 6.8 Barrier for non-incendive field wiring is required for connection to power supply. Electrical parameters are the same as for intrinsic safety.
- Without the use of conduit, *Associated Non-incendive Field Wiring Apparatus* is required for connection to the power supply.
- 6.9 No barrier is required for division 2 / zone 2 installation. Equipment must be wired per the NEC division 2 / zone 2 wiring methods.
- 6.10 Diameter of cable for delivered cable gland is 6 to 12 mm and for the second cable gland with two cable entres is it 4 to 5 mm.
- 6.11 The position feedback module is only for use in temperature class T4.
- 6.12 Before commissioning the indications of the protection type which are not being used has to be removed.
- 6.13 Only certified, intrinsic safety electric circuits must be connected as auxiliary power, control and signal current circuits.
- 6.14 Non-incendive field wiring:
Only connection with approved barrier. Parameters are the same as intrinsic safety save.

7.0 FISCO-Concept

The FISCO Concept allows interconnection of intrinsic safety apparatus to associated apparatus not specifically examined in such combination.

The criteria for interconnection is that the voltage (U_i or V_{max}), the current (I_i or I_{max}) and the power (P_i or P_{max}) which intrinsic safety apparatus can receive and remain intrinsic safety, considering faults, must be equal or greater than the voltage.

(U_o or V_o or V_t), the current (I_o or I_{sc} or I_i) and the power (P_o or P_{max}) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (C_i) and inductance (L_i) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 μ H respectively. In each segment only one active device, normally the associated apparatus, is allowed to provide the necessary energy for the fieldbus system.

The allowed voltage U_o (or V_o or V_t) of the associated apparatus is limited to the range of 14 V d.c. to 24 V d.c. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except to a leakage current of 50 μ A for each connected device.

Separately powered equipment needs a galvanic isolation to assure that the intrinsic safety fieldbus circuit remains passive.

The cable used to interconnect the devices needs to have the parameters in the following range:

loop resistance	R. : 15... 150 Ω /km
inductance per unit length	L.: 0.4 ... 1 mH/km
capacitance per unit length	C.: 80 ... 200 nF/km

$C = C_{line}/line + 0.5 C_{line}/screen$, if both lines are floating or

$C = C_{line}/line + C_{line}/screen$, if the screen is connected to one line.

Maximum allowed cable length:

CLASS I, ZONE 1 ib

length of spur cable:	≤ 30 m
length of trunk cable:	≤ 5 km
total length (sum of trunk and spur cables):	≤ 5 km
length of splice	≤ 1 m

At each end of the trunk cable an approved infallible line termination with the following parameters is suitable:

R = 90...100 W

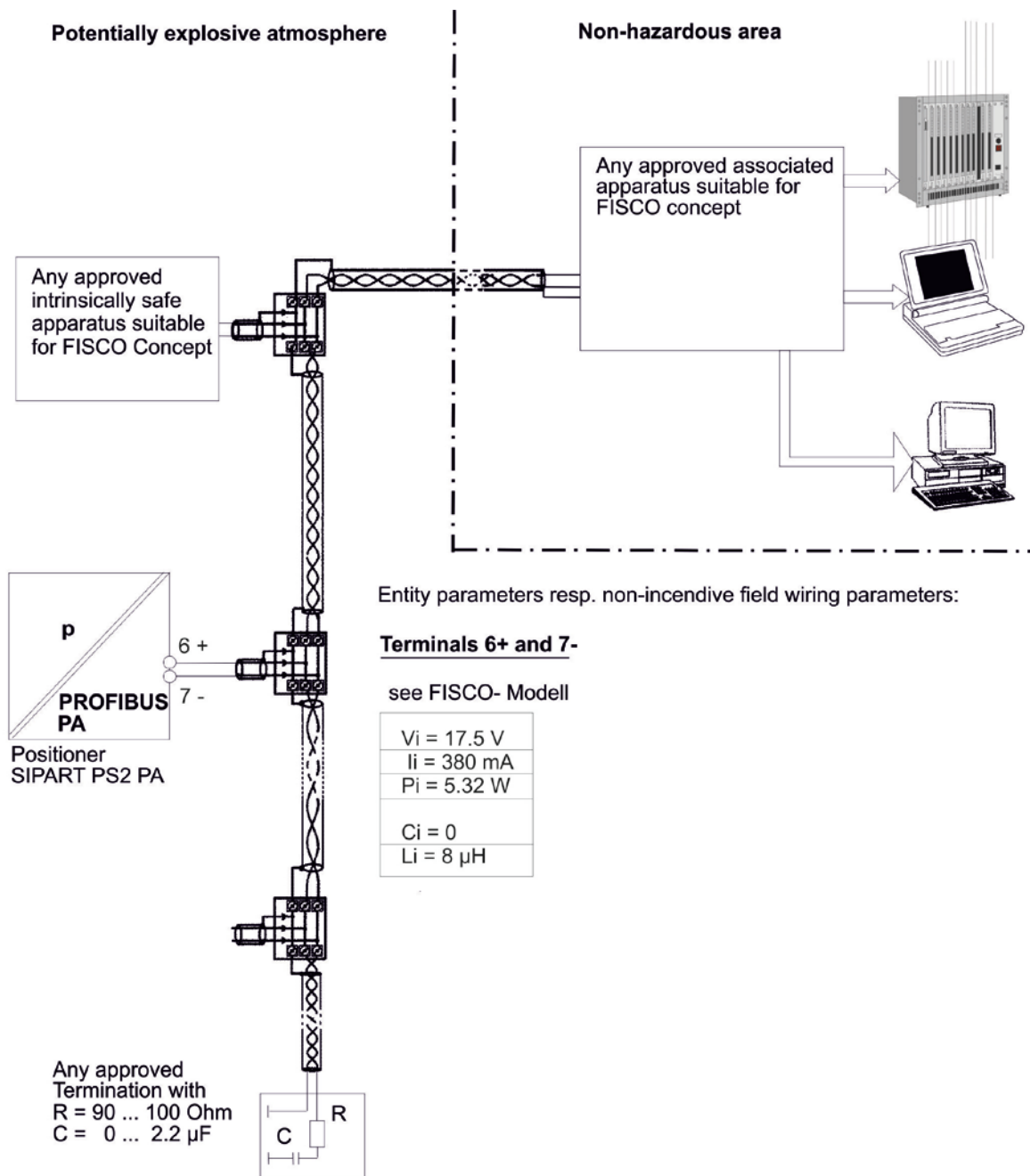
C = 0...2.2 μ F

One of the allowed terminations might already be integrated in the associated apparatus.

The number of passive devices connected to the bus segment is not limited due to I.S. reasons.

If the above rules are respected, up to the specified total length, the inductance and capacitance of the cable will not impair the intrinsic safety or the installation.

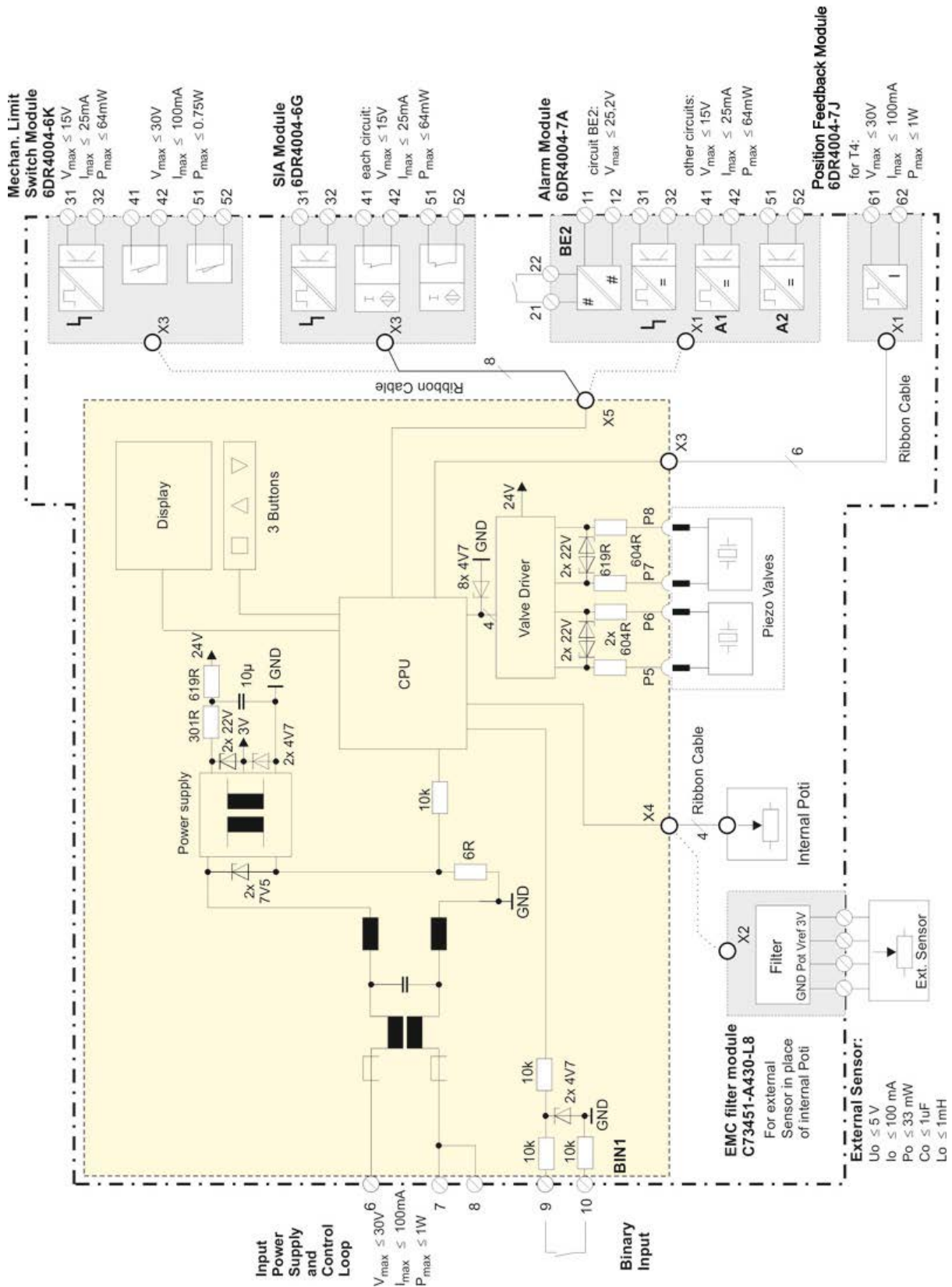
8.0 Block diagram FISCO Wiring



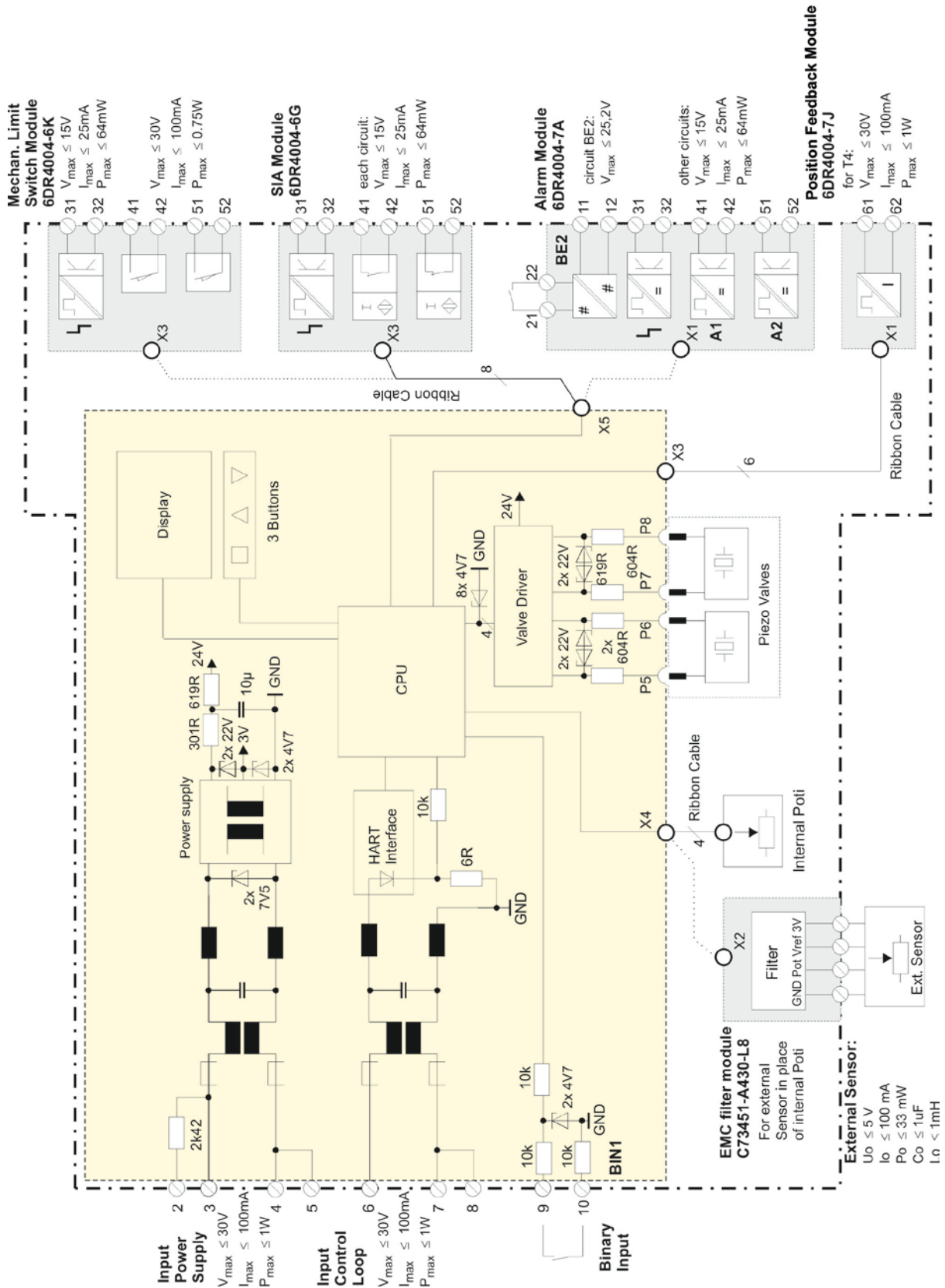
Warning: Substitution of components may impair intrinsic safety. For installing, maintenance or operating see Operating Instructions.

This document contains safety-relevant information based on technical standards (i.e. norms, internal standards) or certifications that the apparatus is subject to and may be altered with the approval of the norm expert (NFM).

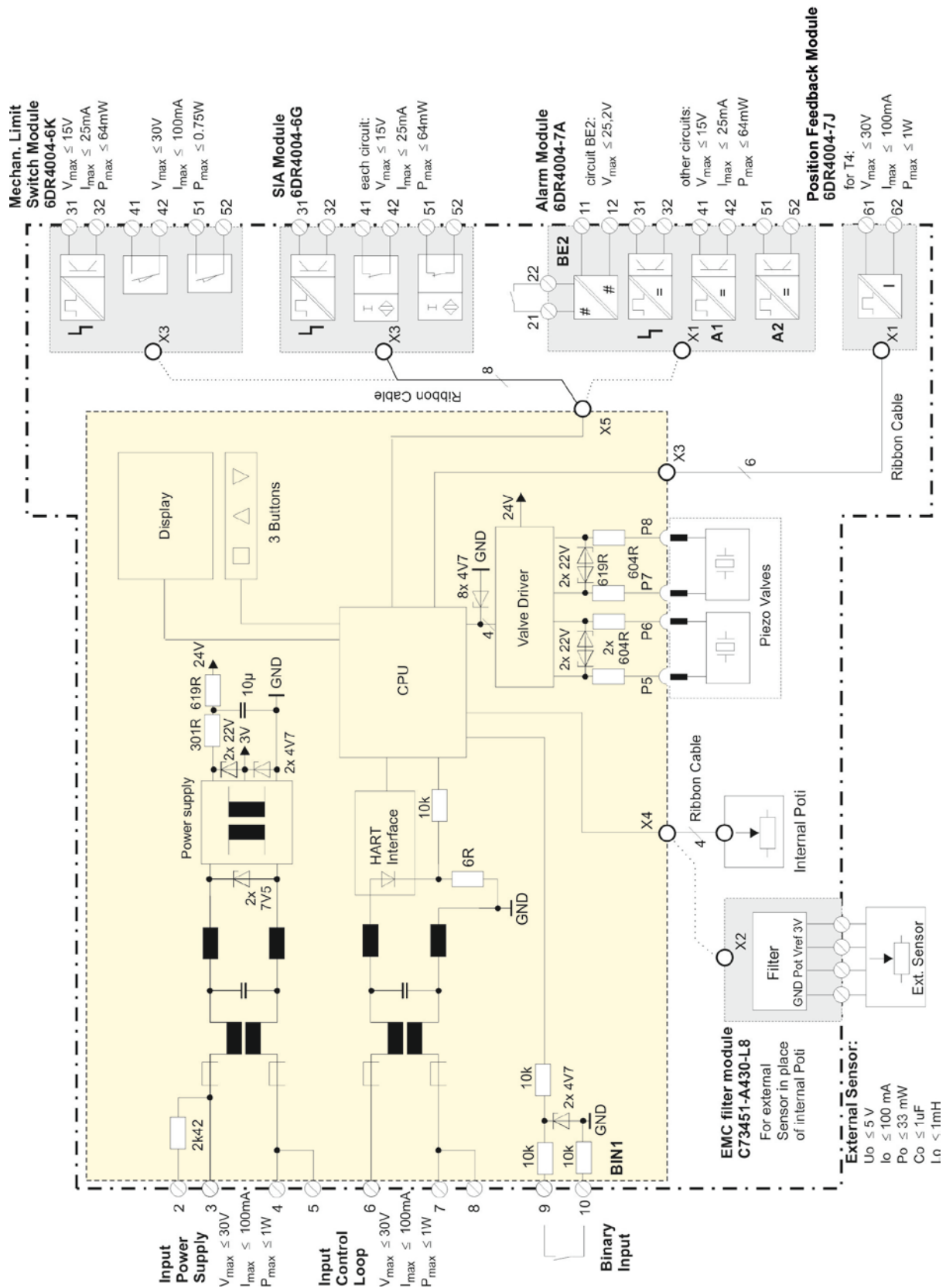
9.0 Block diagram SIPART PS2 / SITRANS VP160 / HART / 2-wire operation



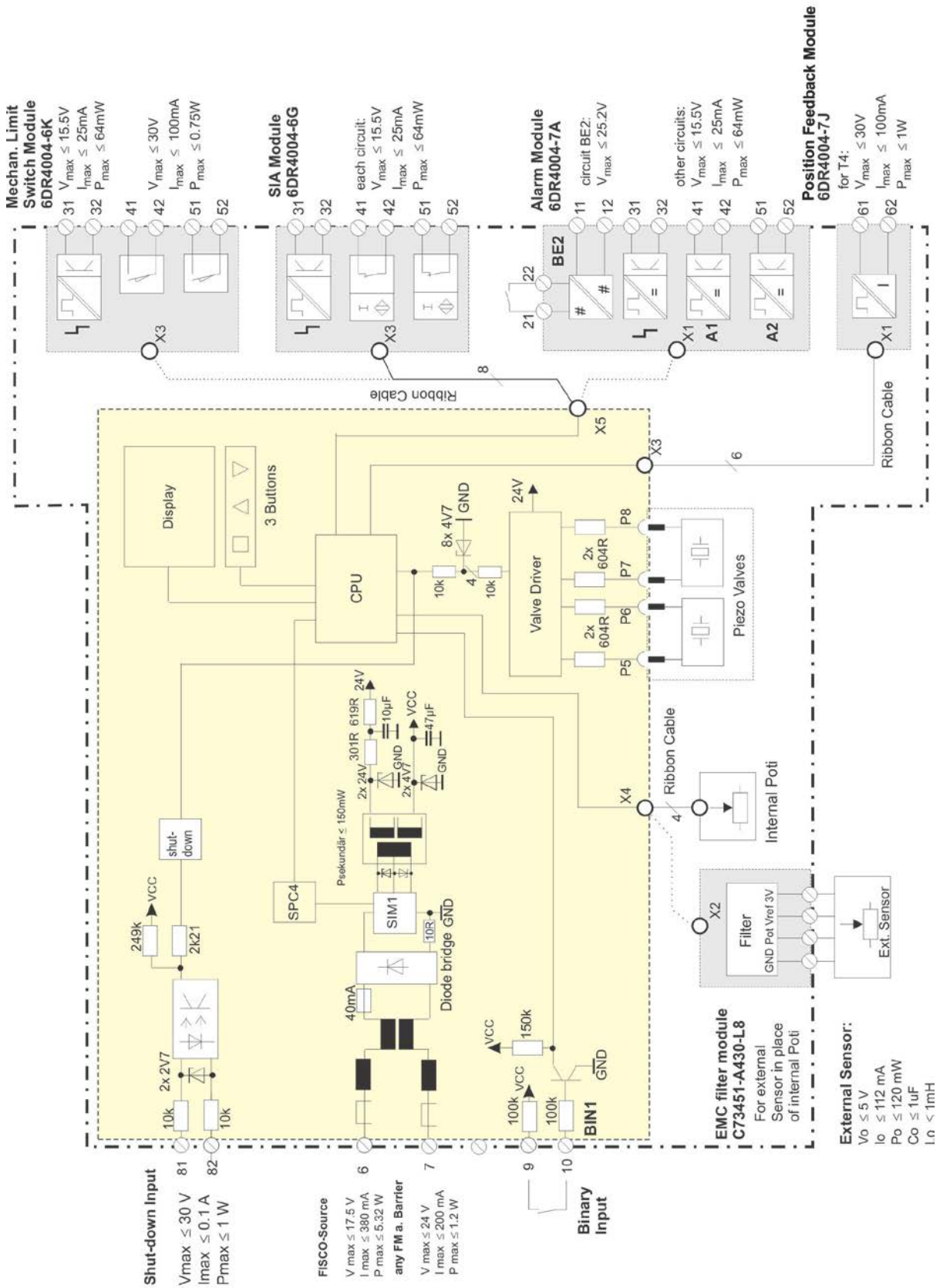
10.0 Block diagram SIPART PS2 / SITRANS VP160 / HART / 4-wire operation



11.0 Block diagram SIPART PS2 / SITRANS VP160 / PA / 4-wire operation



12.0 Block diagram SIPART PS2 / SITRANS VP160 / FF



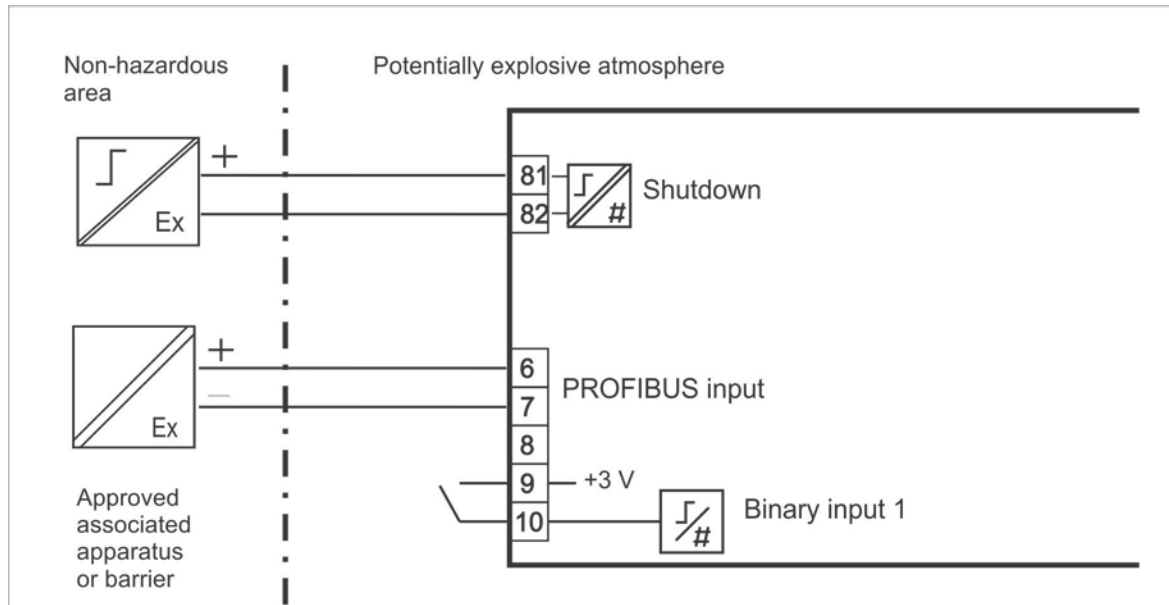
13.0 Connection Overview

Electropneumatic Positioner SIPART PS2 / SITRANS VP160 basic electronic

13.1 FOUNDATION Fieldbus (FF) / PROFIBUS (PA)

SIPART PS2 6DR55...-.....-Z-... (FF)

SIPART PS2 6DR56...-.....-Z-... (PA)



Devision 1 / Zone 1 application:

PROFIBUS/ FOUNDATION Fieldbus input (terminals 6 and 7):

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Fieldbus FISCO-Model	$V_i = 17.5 \text{ V}$	$I_i = 380 \text{ mA}$,	$P_i = 5.32 \text{ W}$
FM approved barrier or power supply	$V_i = 24 \text{ V}$	$I_i = 250 \text{ mA}$,	$P_i = 1.2 \text{ W}$
Effective internal capacitance:	$C_i = 0$		
Effective internal inductance:	$L_i = 8 \mu\text{H}$		

Binary input circuit (terminals 9 and 10):

Connected by jumper, or connection to switching contact.

Shutdown input (terminals 81 and 82):

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

	$V_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 1 \text{ W}$,
Effective internal capacitance:	$C_i = 0$
Effective internal inductance:	$L_i = 0$

Devision 2 application:

PROFIBUS/FOUNDATION input (terminals Fieldbus- 6 and 7):

$V_{\text{max}} = 32 \text{ V}$, $I_{\text{max}} = 4 \text{ A}$

Binary input circuit (terminals 9 and 10):

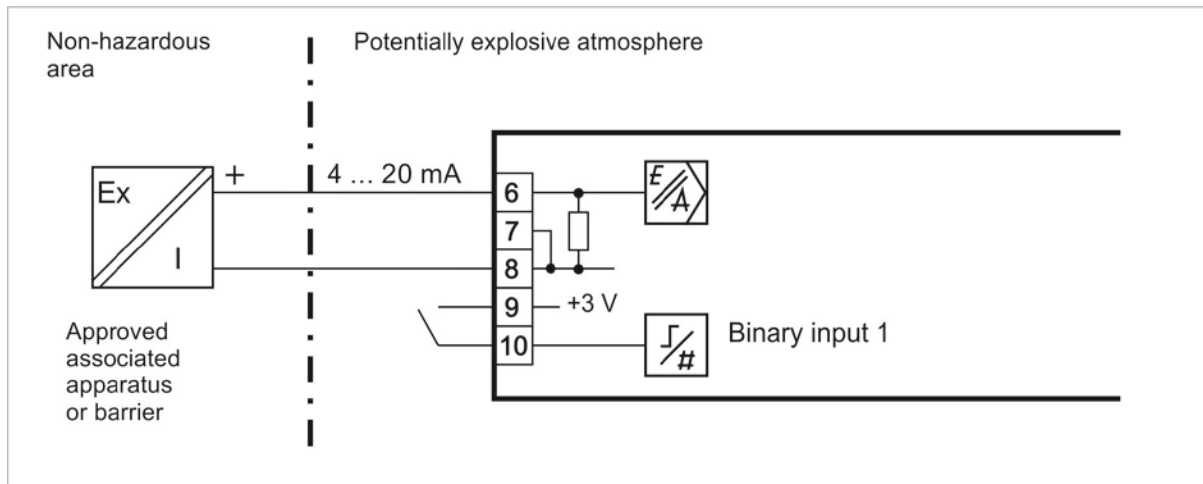
Maximum output: $V = 5 \text{ V}$, $I = 55 \text{ mA}$

Shutdown input (terminals 81 and 82): $V_{\text{max}} = 30 \text{ V}$

13.2 2-Wire connection without HART

SIPART PS2 6DR50..-.....-Z-...

SITRANS VP160 6DR640..-.....-Z-...



Devision 1 / Zone 1 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

$$U_i = 30 \text{ V}$$

$$I_i = 100 \text{ mA}$$

$$P_i = 1 \text{ W}$$

Effective internal capacitance: $C_i = 11 \text{ nF}$

Effective internal inductance: $L_i = 0.207 \text{ } \mu\text{H}$

Binary input circuit (terminals 9 and 10) connected by jumper, or connection to switching contact.

Division 2 application:

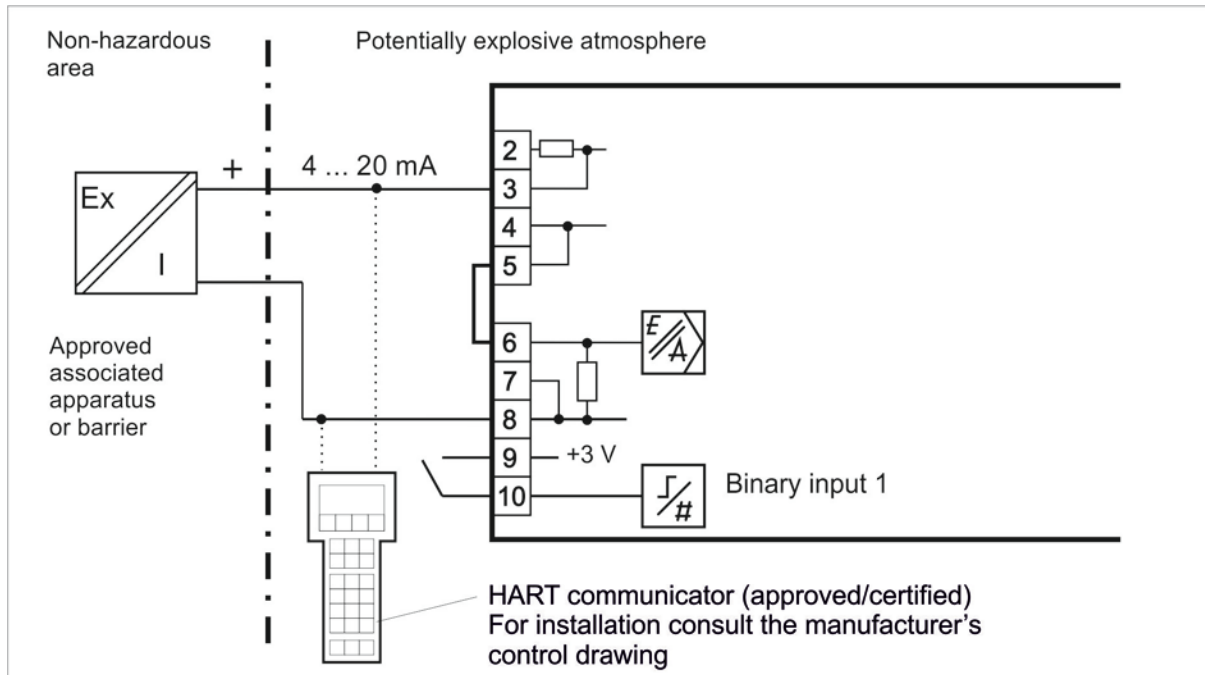
$$V_{\text{max}} = 30 \text{ V}$$

$$I_{\text{max}} = 100 \text{ mA}$$

Binary input circuit (terminals 9 and 10): $V_o = 5 \text{ V}, I_o = 0.25 \text{ mA}$

13.3 2-Wire connection with HART

SIPART PS2 6DR52...-.....-Z-...
 SITRANS VP160 6DR642...-.....-Z-...



Devision 1 / Zone 1 application

Power supply and control circuits connected in series, 4 to 20 mA (terminals 3 and 7/8; jumpers across terminals 4/5-6).

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

$$U_i = 30 \text{ V}$$

$$I_i = 100 \text{ mA}$$

$$P_i = 1 \text{ W}$$

Effective internal capacitance: $C_i = 11 \text{ nF}$

Effective internal inductance: $L_i = 310 \text{ } \mu\text{H}$

Binary input circuit (terminals 9 and 10) connected by jumper, or connection to switching contact.

Division 2 application:

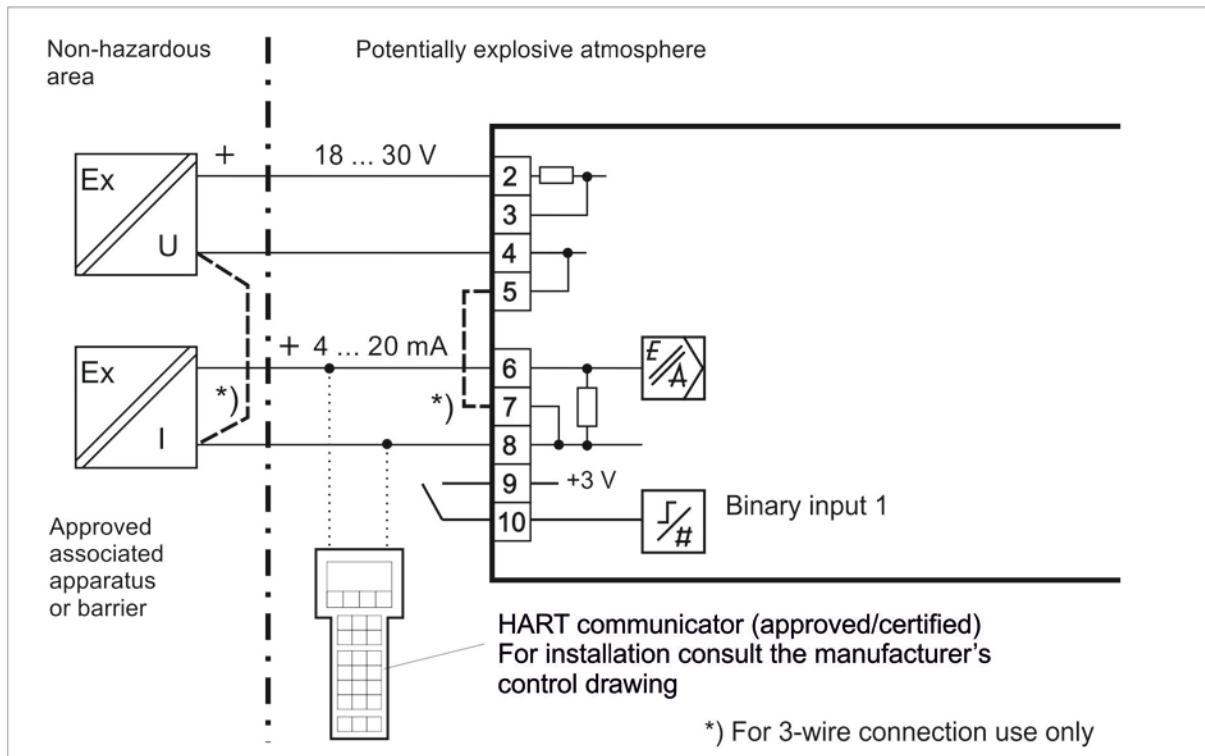
$$V_{\text{max}} = 30 \text{ V}$$

$$I_{\text{max}} = 100 \text{ mA}$$

Binary input circuit (terminals 9 and 10): $V_o = 5 \text{ V}, I_o = 0.25 \text{ mA}$

13.4 3/4-Wire connection with HART

SIPART PS2 6DR52...-.....-Z-...
SITRANS VP160 6DR642...-.....-Z-...



Devision 1 / Zone 1 application

Power supply and control circuits electrically isolated or with common root (terminals 4/5 and 7/8).
Power supply 18 to 30 V (terminals 2 and 4/5). Control current 4 to 20 mA (terminals 6 and 7/8)

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

$U_i = 30 \text{ V}$
 $I_i = 100 \text{ mA}$
 $P_i = 1 \text{ W}$
Effective internal capacitance: $C_i = 11 \text{ nF}$
Effective internal inductance: $L_i = 207 \text{ } \mu\text{H}$

Binary input circuit (terminals 9 and 10) connected by jumper, or connection to switching contact.

Division 2 application:

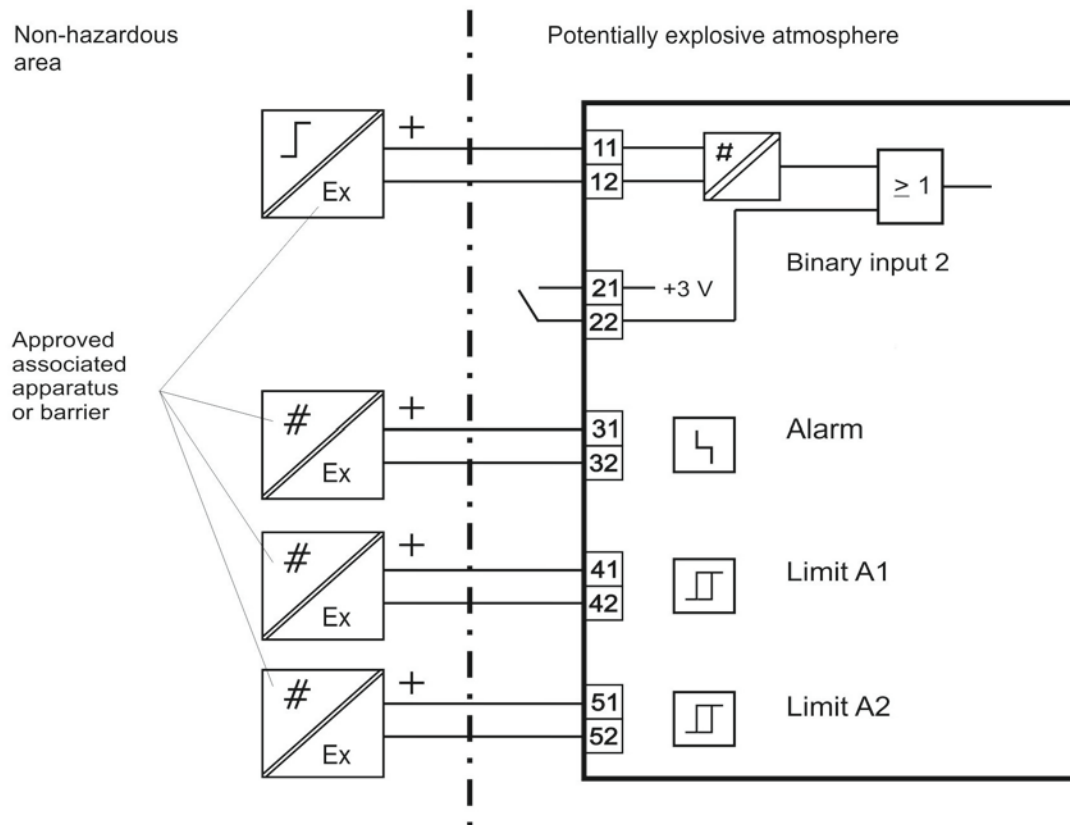
$V_{\text{max}} = 30 \text{ V}$
 $I_{\text{max}} = 100 \text{ mA}$

Binary input circuit: (terminals 9 and 10): $V_o = 5 \text{ V}$, $I_o = 0.25 \text{ mA}$

14 Connection Overview

Electropneumatic Positioner SIPART PS2 / SITRANS VP160 Options

14.1 Alarm module 6DR4004-7A; 6DR4004-7J



Devision 1 / Zone 1 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Binary output circuits

Terminals (31+ and 32); (41+ and 42); (51+ and 52)

Safe electrical isolation from each another

$$U_i = 15 \text{ V}$$

$$I_i = 25 \text{ mA}$$

$$P_i = 64 \text{ mW}$$

Effective internal capacitance:

$$C_i = 5.2 \text{ nF}$$

Effective internal inductance:

$$L_i = 0$$

Binary input circuit

Terminals (11+ and 12)

Safe electrical isolation from the binary outputs and the basic device.

Terminals (21 and 22)

Jumpered, no electrical isolation from basic device.

$$U_i = 25,2 \text{ V}$$

$$I_i = 155 \text{ mA}$$

Effective internal capacitance:

$$C_i = 0$$

Effective internal inductance:

$$L_i = 0$$

Division 2 application:

$V_{max} = 15 \text{ V}$

Binary input circuit

Terminals (11+ and 12)

$V_{max} = 25.2 \text{ V}$

Safe electrical isolation from the binary outputs and the basic device.

Binary input circuit

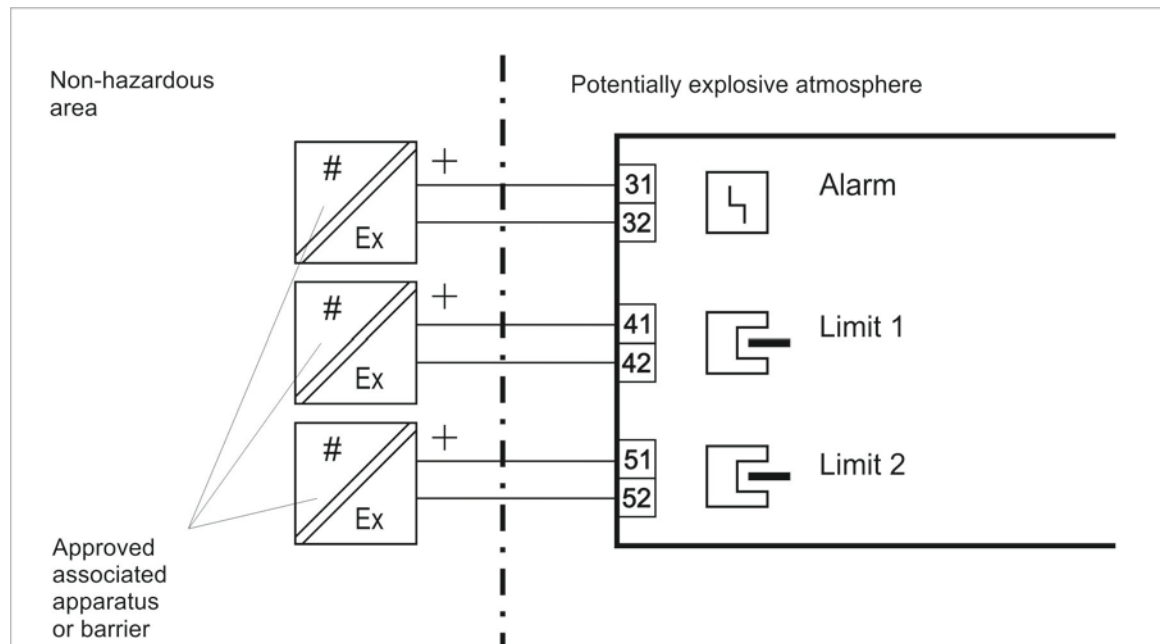
Jumpered, no electrical isolation from basic device.

Terminals (21+ and 22)

$V_{max} = 5 \text{ V}$

$I_{max} = 0.01 \text{ mA}$

14.2 SIA module 6DR4004-6G



Devison 1 / Zone 1 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Binary output circuits

Terminals (31+ and 32)

$U_i = 15 \text{ V}$

$I_i = 25 \text{ mA}$

$P_i = 64 \text{ mW}$

Effective internal capacitance:

$C_i = 5.2 \text{ nF}$

Effective internal inductance:

$L_i = 0$

Terminals (41+ and 42) or (51+ and 52)

$U_i = 15 \text{ V}$

$I_i = 25 \text{ mA}$

$P_i = 64 \text{ mW}$

Effective internal capacitance:

$C_i = 41 \text{ nF}$

Effective internal inductance:

$L_i = 0,1 \text{ mH}$

Division 2 application:

Binary output circuits

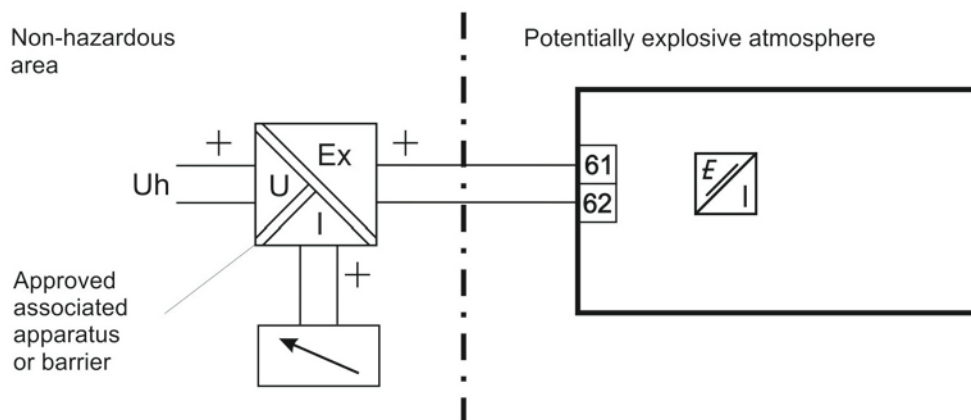
Terminals (31+ and 32)

$V_{max} = 15 \text{ V}$

Terminals (41+ and 42) or (51+ and 52)

$I_{max} = 25 \text{ mA}$

14.3 Position feedback module 6DR4004-7J



Division 1 / Zone 1 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Only for use in temperature class T4

Current output circuit

Terminals (61+ and 62)

Electrically isolated from inserted other modules and basic device

$$U_i = 30 \text{ V}$$

$$I_i = 100 \text{ mA}$$

$$P_i = 1 \text{ W}$$

Effective internal capacitance:

$$C_i = 11 \text{ nF}$$

Effective internal inductance:

$$L_i = 0$$

Division 2 application:

Current output circuit

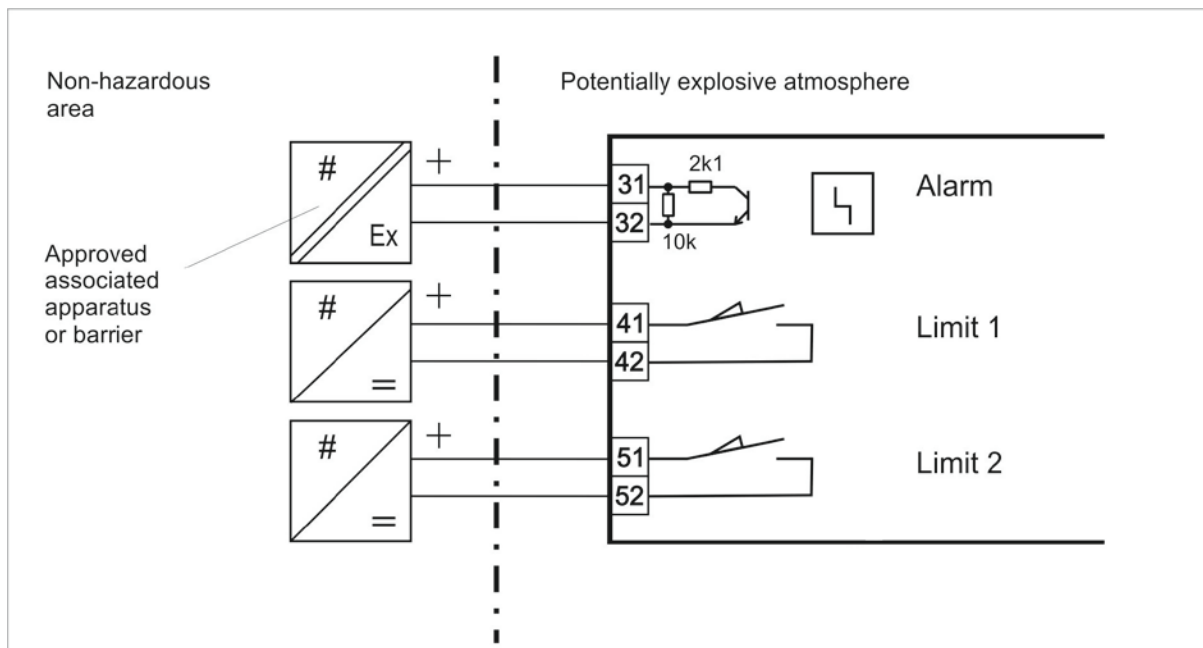
Terminals (61+ and 62)

Electrically isolated from inserted other modules and basic device

$$V_{\text{max}} = 30 \text{ V}$$

$$I_{\text{max}} = 100 \text{ mA}$$

14.4 Limit switch module 6DR4004-6K



Division 1 / Zone 1 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Binary output circuit

Terminals (31+ and 32)

Electrically isolated from inserted other modules and basic device

$$U_i = 15 \text{ V}$$

$$I_i = 25 \text{ mA}$$

$$P_i = 64 \text{ mW}$$

Effective internal capacitance: $C_i = 5.2 \text{ nF}$

Effective internal inductance: $L_i = 0$

Terminals (41+ and 42) or (51+ and 52)

Electrically isolated from inserted other modules and basic device

$$U_i = 30 \text{ V}$$

$$I_i = 100 \text{ mA}$$

$$P_i = 750 \text{ mW}$$

Effective internal capacitance: $C_i = 0$

Effective internal inductance: $L_i = 0$

Division 2 application:

Binary output circuit

Terminals (31+ and 32)

$$V_{\text{max}} = 15 \text{ V}$$

$$P_{\text{max}} = 64 \text{ mW}$$

Terminals (41+ and 42) or (51+ and 52)

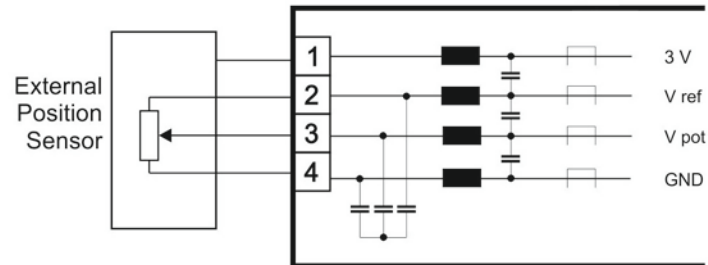
$$V_{\text{max}} = 30 \text{ V}$$

$$P_{\text{max}} = 750 \text{ mW}$$

14.5 EMC filter module C73451-A430-D23

(For connection of a passive potentiometer or position sensor)

Potentially explosive atmosphere



Devison Division 1 / Zone 1 or Division 1 / Zone 2 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Terminals (1...4)

$$U_o \leq 5 \text{ V}$$

$$I_o \leq 112 \text{ mA}$$

$$P_o \leq 120 \text{ mW}$$

Max. allowed capacitance:

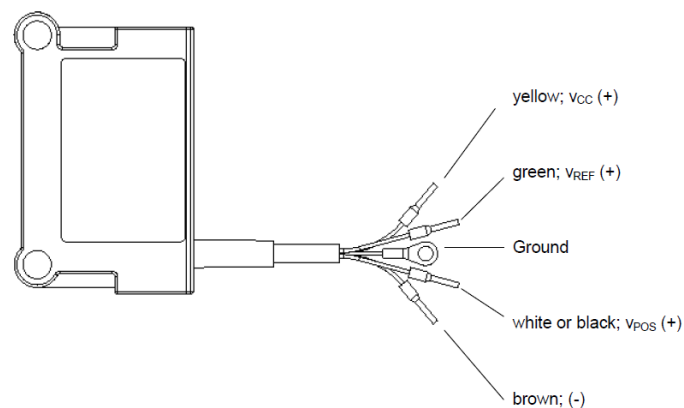
$$C_o \leq 1 \text{ } \mu\text{F}$$

Max. allowed inductance:

$$L_o \leq 1 \text{ mH}$$

14.6 Non contacting Sensor (NCS) 6DR4004-6N...-...

(Position sensor, connectable to EMC-Filter module C73451-A430-D23)



Devison 1 / Zone 1 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Wires (x...y))

$$U_i = 5 \text{ V}$$

$$I_i = 160 \text{ mA}$$

$$P_i = 120 \text{ mW}$$

Effective internal capacitance:

$$C_i = 180 \text{ nF}$$

Effective internal inductance:

$$L_i = 922 \text{ } \mu\text{H}$$

Devison 2 / Zone 2 application

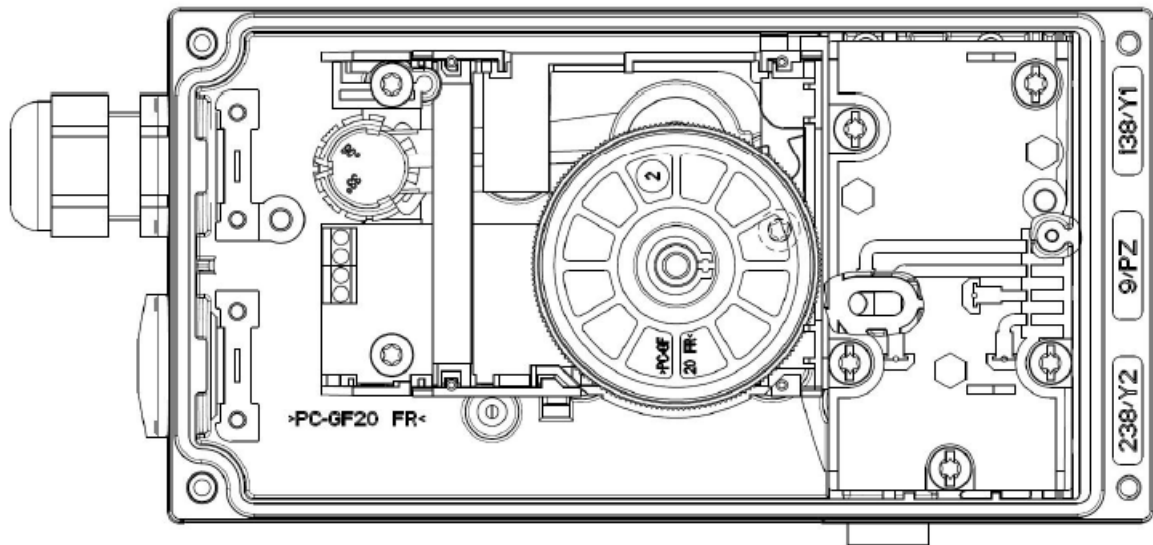
Wires (x...y))

$$U_{\text{max}} = 5 \text{ V}$$

$$I_{\text{max}} = 160 \text{ mA}$$

14.7 External position detection system (EPDS) C73451-A430-D23

(Passive Potentiometer connectable to EMC-Filter module C73451-A430-D23)



Devision 1 / Zone 1 application

With type of protection "Intrinsic safety", only for connection to certified intrinsic safety circuits with the following maximum values:

Terminal (x...y)

$U_i = 5 \text{ V}$

Effective internal capacitance:

$C_i = 10 \text{ nF}$

Effective internal inductance:

$L_i = 240 \text{ } \mu\text{H}$

Devision 2 / Zone 2 application

Terminal (x...y)

$U_{\text{max}} = 5 \text{ V}$

Get more information

www.siemens.com/processautomation
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