MVP Smart Positioner

Safety Instruction

Revision: A0

Date： 2026/03

Catalogue

1 General

This document covers the installation, wiring and maintenance requirements for operating valve positioners (hereinafter referred to as this product) in potentially explosive atmospheres or combustible dust zones. Compliance with these requirements ensures that this product will not ignite the surrounding explosive gases. Hazards related to process control are not covered by this manual.

Given that the installation of this product on specific actuators and valves generally does not affect its suitability for use in potentially hazardous gas or dust environments, relevant installation instructions are not elaborated in this document. For further details, please refer to the corresponding user manual if necessary.

	**Warning!** **Failure to comply with the requirements set forth in this document may result in loss of life and property.**

Note: Please contact our to obtain the latest documentation. Updates are subject to change without prior notice.

2 Product Selection

2.1 Intrinsically Safe Type

Model: MVP35*abc* – *def* – *ghi* – *jkl* - *m* - *n*

Code	Configuration	Option	Description	Note
a	Device Type	0	Standard integrated type	1)
		5	Standard remote sensor type	
		6	Remote sensor type with metal gear	
		7	Integrated type without pneumatic pipe	
		X	Integrated type bottom intake	
		8	Remote sensor type with bottom intake	
		9	Remote sensor type with metal gear & bottom intake	
b	Failsafe	0	Failsafe reset (exhaust)	
		1	Failsafe freeze (hold)	2)
c	Actuator	L	Linear actuator	
		S	Linear actuator with stroke less than 16mm	3)
		R	Rotary actuator	
d	Acting	1	Single-acting	
		2	Double-acting	

Code	Configuration	Option	Description	Note
e	Explosion-proof	0	Without explosion-proof	
		1	Low temperature without explosion-proof	
		E	CCC Ex ia for gas	
		P	CCC Ex ia for gas & dust	
		F	IECEX or ATEX Ex ia for gas	
		T	IECEX or ATEX Ex ia for gas & dust	
		L	CCC Ex ia for gas & dust with low temperature	
f	Communication	0	Without	
		H	HART	
		P	Profibus PA	4)
		F	FF	4)
g	Key & Indication	0	Without	
		K	Key	
		R	Key + Position mechanical indication	
h	Analog Output	0	无	
		F	4~20mA position feedback output	
i	Digital Output	0	Without	
		1	Electronic switches	
j	Electrical/Pneumatic Connection Thread	G	M20x1.5 / G1/4	
		N	M20x1.5 / 1/4NPT	
		M	1/2NPT / 1/4NPT	
		P	1/2NPT / G1/4	
k	Copper-free Aluminum Housing & Pressure Gauge	0	Without	
		1	Pressure gauge block	
		2	Stainless steel gauge block	
		G	Copper-free aluminum housing w/o gauge block	
		S	Copper-free aluminum housing + SS gauge block	
l	Additional Options	0	Without	
		1	Lightning protection	5)
		S	Stainless steel housing	
		T	Lightning protection + stainless steel housing	5)
m	Position Sensor	Blank	Potentiometer	
		1	Non-contact position sensor (NCS)	6)
n	Customer Code	Code	Customer code	7)
Note	1) Standard pneumatic configuration is middle intake 2) Fail-safe freeze option is not available for low-temperature type 3) For strokes less than 16 mm, the 1:6 small-stroke option is recommended; for strokes less than 10 mm, the 1:6 small-stroke option **must** be selected 4) If PA or FF communication is selected, then the options of 4-20 mA current output, electronic switch outputs, and intrinsically safe explosion-proof (Ex ia) is not available 5) If lightning protection is selected, grounding must be performed in accordance with			

Code	Configuration	Option	Description	Note
	relevant standards. The lightning protection rating is 10 kV / 5 kA 6) If NCS is selected, note 3) can be disregarded 7) The customer code is not related to explosion-proof			

2.2 Flameproof Type

Model: MVP36*abc – def – ghi – jkl - m*

Code	Configuration	Option	Description	Note
a	Device Type	0	Standard integrated type	1)
		7	Standard integrated type w/o air manifold	
		X	Standard integrated type with bottom intake	
b	Failsafe	0	Failsafe reset (exhaust)	
		1	Failsafe freeze (hold)	2)
c	Actuator	L	Linear actuator	
		S	Linear actuator with stroke less than 16mm	3)
		R	Rotary actuator	
d	Acting	1	Single-acting	
		2	Double-acting	
e	Explosion-proof	D	CCC-Ex d	
		P	CCC-Ex d & Ex t	
		E	CCC-Ex i & Ex d	
		F	IECEx or ATEX-Ex i & Ex d	
		3	IECEx or ATEX-Ex d & Ex t	
		4	CCC-Ex d & Ex t for low temperature type	
f	Communication	0	Without	
		H	HART	
		P	Profibus PA	4)
		F	FF	4)
g	Key	K	Key	
h	Analog Output	0	Without	
		F	4~20mA position feedback output	
i	Digital Output	0	无	
		1	Electronic switches	
j	Electrical/Pneumatic Connection Thread	G	M20x1.5 / G1/4	
		N	M20x1.5 / 1/4NPT	
		M	1/2NPT / 1/4NPT	
		P	1/2NPT / G1/4	
k	Copper-free Aluminum Housing & Pressure Gauge	0	Without	
		1	Standard pressure gauge block	
		2	Stainless steel pressure gauge block	
		G	Copper-free aluminum housing w/o gauge block	
		S	Copper-free aluminum housing + SS gauge block	

Code	Configuration	Option	Description	Note
l	Additional Options	0	Without	
		1	Lightning protection	5)
		S	Stainless steel housing	
		H	Copper-free aluminum housing + Enhanced anti-corrosion coating	
		R	Lightning protection + copper-free aluminum housing + Enhanced anti-corrosion coating	5)
		T	Lightning protection + Stainless steel housing	5)
m	Customer Code	Code	Customer code	6)
Note	1) Standard pneumatic configuration is middle intake 2) Fail-safe freeze option is not available for low-temperature type 3) For strokes less than 16 mm, the 1:6 small-stroke option is recommended; for strokes less than 10 mm, the 1:6 small-stroke option **must** be selected 4) If PA or FF communication is selected, then the options of 4-20 mA current output, electronic switch outputs, and intrinsically safe explosion-proof (Ex ia) is not available 5) If lightning protection is selected, grounding must be performed in accordance with relevant standards. The lightning protection rating is 10 kV / 5 kA 6) The customer code is not related to explosion-proof			

2.2 NCS flameproof type

型号：MVP38*abc – def – ghi – jkl - m*

Code	Configuration	Option	Description	Note
a	Device Type	0	Standard integrated type	1)
		7	Standard integrated type w/o air manifold	
b	Failsafe	0	Failsafe reset (exhaust)	
		1	Failsafe freeze (hold)	2)
c	Actuator	L	Linear actuator	
		R	Rotary actuator	
d	Acting	1	Single-acting	
		2	Double-acting	
e	Explosion-proof	D	CCC Ex d	
		P	CCC Ex d & Ex t	
		4	CCC Ex d for low temperature type	
		5	CCC Ex d & Ex t for low temperature type	
f	Communication	0	Without	
		H	HART	
		P	Profibus PA	3)
		F	FF	3)
g	Key	K	Key	
h	Analog Output	0	Without	
		F	4~20mA position feedback output	

Code	Configuration	Option	Description	Note
i	Digital Output	0	Without	
		1	Electronic switches	
j	Electrical/Pneumatic Connection Thread	G	M20x1.5 / G1/4	
		N	M20x1.5 / 1/4NPT	
		M	1/2NPT / 1/4NPT	
		P	1/2NPT / G1/4	
k	Copper-free Aluminum Housing & Pressure Gauge	0	Without	
		1	Standard pressure gauge block	
		2	Stainless steel pressure gauge block	
		G	Copper-free aluminum housing w/o gauge block	
		S	Copper-free aluminum housing + SS gauge block	
l	Additional Options	0	Without	
		1	Lightning protection	4)
		S	Stainless steel housing	
		H	Copper-free aluminum housing + Enhanced anti-corrosion coating	
		R	Lightning protection + copper-free aluminum housing + Enhanced anti-corrosion coating	4)
		T	Lightning protection + Stainless steel housing	4)
m	Customer Code	Code	Customer code	5)
Note	1) Standard pneumatic configuration is middle intake 2) Fail-safe freeze option is not available for low-temperature type 3) If PA or FF communication is selected, then the options of 4-20 mA current output, electronic switch outputs, and intrinsically safe explosion-proof (Ex ia) is not available 4) If lightning protection is selected, grounding must be performed in accordance with relevant standards. The lightning protection rating is 10 kV / 5 kA 5) The customer code is not related to explosion-proof			

3 Explosion-proof certifications

The following certifications have been tested and approved by NEPSI.

CCC	Intrinsic Safety (Gas)	Ex ia II C T4...T6 Ga
	Intrinsic Safety (Dust)	Ex ia III C T_{200}80℃...T_{200}130℃ Da
	Flameproof (Gas)	Ex db IIC T4...T6 Gb
	Flameproof (Dust)	Ex tb IIIC T80℃...T105℃ Db
IECEx	Intrinsic Safety (Gas)	Ex ia IIC T4...T6 Ga

	Intrinsic Safety (Dust)	Ex ia IIIC T80℃/T95℃/T130℃ Da
	Flameproof (Gas)	Ex db IIC T6...T4 Gb
	Flameproof (Dust)	Ex tb IIIC T80℃...T105℃ Db
ATEX	Intrinsic Safety (Gas)	 II 1G Ex ia IIC T6...T4 Ga
	Intrinsic Safety (Dust)	 II 1D Ex ia IIIC T80℃...T130℃ Da
	Flameproof (Gas)	 II 2G Ex db IIC T6...T4 Gb
	Flameproof (Dust)	 II 2G Ex tb IIIC T80℃...T105℃ Da

Contact us for the latest explosion-proof certification information.

4 Operating Conditions

Normal operating conditions are listed in the table.

Ambient temperature	-40℃~+80℃	Input current	4~20mA	IP grade	IP66
Air supply pressure	0.14~0.7MPa, Clean compressed air shall be used as the air supply.				

Special (Restricted) Conditions of Use:

1) Measures shall be taken to prevent the accumulation of electrostatic charges on the enclosure.

2) When the product is installed in areas requiring EPL Ga classification, the user shall take effective measures to prevent ignition hazards caused by impact or friction on the enclosure.

3) When choose lightning protection (selection code I is 1, R or T), the product cannot pass the 500V dielectric withstand voltage test; corresponding protective measures shall be taken during onsite use.

4) The relationship between ambient temperature, temperature group and maximum surface temperature is as follows:

Ambient Temperature Range	Temperature Group	Maximum Surface Temperature
(-40~+50) °C	T6	T_{200}80℃
(-40~+65) °C	T5	T_{200}95℃
(-40~+80) °C	T4	T_{200}130℃
(-30~+50) °C	T6	T_{200}80℃
(-30~+65) °C	T5	T_{200}95℃
(-30~+80) °C	T4	T_{200}130℃

5 Installation Requirements

Installation and maintenance may only be performed by authorized qualified personnel.

The classification of explosive hazardous areas, protection type, temperature class, gas group and ingress protection rating must comply with the data shown on the product nameplate, labels, and in this document.

Cables and conduits shall comply with relevant local and national regulations.
The rated operating temperature of the cables shall be at least 5°C higher than the expected maximum ambient temperature.
All cables for electrical connections shall be equipped with a metallic shield and properly grounded.
If the type of protection depends on the cable gland, the cable gland for the required type of protection must be certified.

Certified for -40°C low ambient temperature. However, two temperature types are available: standard type (-30°C) and low-temperature type (-40°C), as detailed in the selection code.
To ensure optimum performance, it is essential to ensure that the actual operating ambient temperature does not exceed the requirements indicated on the nameplate.

Under normal operation, compressed air is discharged from the product into the surrounding area.
Hazardous area assessment is the responsibility of the end user.
Area ventilation and other safety procedures may be required to maintain a safe environment.

Before installation, check the information on the product nameplate and ensure that the onsite air supply pressure and operating temperature do not exceed the ranges marked on the nameplate.

When an aluminum alloy enclosure is selected, care must be taken during installation to avoid impacts or friction that could generate ignition sources.
To avoid potential electrostatic discharge hazards, the guidance detailed in relevant explosion-proof standards must be followed.

Only use the damp cloth to clean or wipe the equipment when there is no potentially explosive atmosphere around the product. The use of dry cloths and solvents is strictly prohibited.

When installed in hazardous dust areas of Zones 20, 21 and 22, regular cleaning must be performed to prevent dust accumulation on the product surface.

Before being put into operation, the product enclosure shall be securely installed and properly sealed to maintain reliable protection.

6 Electrical Connections

Non-intrinsic safety equipment is prohibited from use in intrinsic safety systems. Intrinsically safe products must be used in Hazardous Zone 0.

Only certified safety barriers that meet the intrinsic safety parameter requirements specified in this document shall be selected for use with intrinsically safe valve positioners. Field wiring shall comply with relevant local and national laws and regulations where installed.

Hand-held operators may only be used in hazardous areas after being certified by a recognized authority, and their current output specifications shall comply with the requirements of relevant equipment.

Cables meeting relevant explosion-proof requirements shall be used in hazardous areas, and electrical connections shall be made in accordance with applicable local and national laws and regulations of the installation site.

Cables shall be provided with a grounded shield or be installed in separate metal conduits. Cable shielding and safety barrier grounding shall comply with relevant local and national laws and regulations.

The total equivalent capacitance and inductance in the electrical connection (sum of capacitance and inductance of the safety barrier, cables, valve positioner and hand-held operator) shall not exceed the allowable values indicated for the system unit.

	**Warning!** **Do not perform electrical connection work while power is on.**

6.1 Wiring Requirements

Users shall select cable glands suitable for the electrical interface thread size of the selected product. For flameproof products, certified explosion-proof cable glands shall also be used.
Users shall select cables with an overall diameter (including outer sheath) not smaller than the inlet size of the cable gland (after tightening) to ensure a proper seal. For outdoor installation, a U-shaped bend

toward the ground shall be formed in the cable before it enters the cable gland, with its lowest point at least 10 cm below the inlet to prevent rainwater from running along the cable into the product.

Modules	Terminal Number	Function	Strip Length	Suitable Wire Size	Tightening Torque
Mainboard	1~2	4-20mA input	6~8mm	26~14AWG	Min. 0.4Nm Max. 0.6Nm
	3-4	Digital input (1)			
Additional Function Module	11-12	4-20mA output			
	21-22	Digital output 1			
	31-32	Digital output 2			

Note: (1) Depending on the product model, the mainboard may or may not be provided with a digital input function.

6.2 Mainboard

6.2.1 Electrical Specifications

The mainboard is equipped with 4–20mA input. Depending on the product model, the mainboard may or may not be provided with a digital input function.

Signal	Two-wire 4-20mA		
Min. work current	⩾3.6mA DC (w/o HART) ⩾3.8mA DC (with HART)	Input Impedance	ab. 455Ω@20mA (w/o HART) ab. 575Ω@20mA (with HART)

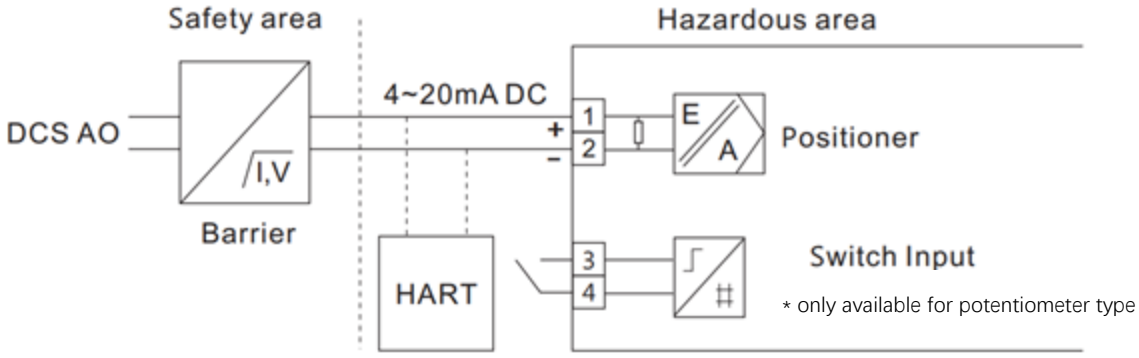
6.2.2 Intrinsic Safety Parameters and Safety Barrier Requirements

The intrinsic safety parameters and requirements for the safety barriers are shown in the table below.

Positioner				Safety Barrier	
Terminals	Function	Intrinsic Safety Parameters		Requirements	
1+ 2-	4~20mA input	Ui	28VDC	Uo	⩽28V DC
		Ii	93mA	Io	⩽93mA
		Pi	650mW	Po	⩽650mW
		Ci	18nF		
		Li	≈0 mH		
3+ 4-	Digital input	Uo	5.36VDC	Ui	⩾28V DC
		Io	0.28mA	Ii	⩾93mA
		Po	0.37mW	Pi	⩾0.65W
		Co	2uF	Ci	< 2uF
		Lo	5mH	Li	< 5mH

6.2.3 Electrical Connections

The electrical connections of the mainboard are shown in the figure below. Safety barriers are not required for non-intrinsically safe types.



6.3 Analog Output Module

6.3.1 Electrical Specifications

The analog output module can provide 4 to 20mA output as position feedback function, with its electrical specifications detailed in the following table.

Signal	2 wires 4-20mA with external power distribution	Power Supply Voltage	12~28VDC
Range	3.6~20.5mA	Accuracy	±0.1% Temperature Influence≤100ppm/℃

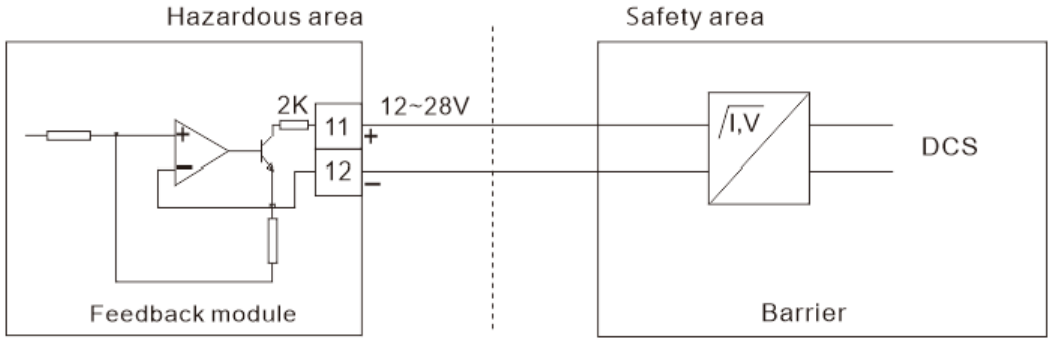
6.3.2 Intrinsic Safety Parameters and Safety Barrier Requirements

This chapter applies only to intrinsically safe products. The intrinsic safety parameters and requirements for the connected safety barriers are shown in the table below.

Positioner				Safety Barrier	
Terminals	Function	Intrinsic Safety Parameters		Requirements	
11+/12-	4~20mA output	Ui	28VDC	Uo	≤28V DC
		Ii	93mA	Io	≥93mA
		Pi	650mW	Po	≥0.65W
		Ci	10nF		
		Li	≈0mH		

6.3.3 Electrical Connections

The electrical connections of this module are shown in the figure below. Safety barriers are not required for non-intrinsically safe types.



6.4 Digital Output Module

6.4.1 Electrical Specifications

The electrical specifications of this module are shown in the table below.

Signal type	NAMUR	Power supply voltage	⩽15.5VDC
Output	Status	Output current	
	High level (logic 1)	⩾2.1mA	
	Low level (logic 0)	⩽1.2mA	

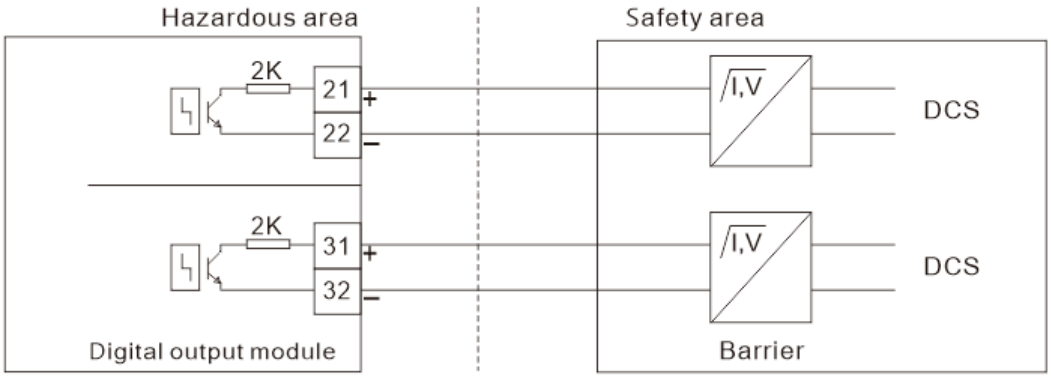
6.4.2 Intrinsic Safety Parameters and Safety Barrier Requirements

This chapter applies only to intrinsically safe products. The intrinsic safety parameters and requirements for the connected safety barriers are shown in the table below.

Positioner				Safety Barrier	
Terminals	Function	Intrinsic Safety Parameters		Requirements	
21+/22- 31+/32-	Digital outputs	Ui	15.5VDC	Uo	⩽15.5V DC
		Ii	25mA	Io	⩽25mA
		Pi	96.9mW	Po	⩽96.9mW
		Ci	≈0uF		
		Li	≈0mH		

6.4.3 Electrical Connections

The electrical connections of this module are shown in the figure below. Safety barriers are not required for non-intrinsically safe types.



7 Maintenance and Service

Only authorized service personnel are permitted to perform repairs.

Only genuine parts provided by our company or authorized and approved components may be used for onsite addition, replacement and maintenance.

The following spare parts are available from our company:

- Mainboard
- Additional function module
- Pneumatic module
- Upper cover assembly
- Base housing assembly
- Pressure gauge block

	**Warning!** **Risk of explosion. Replacement of parts may impair suitability for use in hazardous areas.** **Repairing or damaging the explosion-proof structure of flameproof products is prohibited.**

Please contact us for further technical support.

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8 Revision History

Revision	Contents	Date
A0	Initial Release	2026/03