



**SMART POSITIONER
YT-3300 / 3350 / 3303 / 3301 SERIES**

PRODUCT MANUAL



YT-3300



YT-3300 with limit switch



YT-3350



YT-3303



YT-3301



VERSION 1.11

شرکت فنی مهندسی کنترل تک فعال در زمینه ی فروش ، مشاوره فنی رایگان و آموزش ابزار دقیق

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1. Introduction

1.1 General Information for the users

Thank you for purchasing Young Tech Co., Ltd products. Each product has been fully inspected after its production to offer you the highest quality and reliable performance. Please read the product manual carefully prior to installing and commission the product.

- The manual should be provided to the end-user.
- **Factory Mutual approved Intrinsically Safe and Non-Incendive units must be Installed Per drwg SKC_18601_150326.pdf**
- **CSA approved Intrinsically Safe and Non-Incendive units must be Installed Per drwg SKC-8465.pdf**
- The manual can be altered or revised without any prior notice. Any changes in product's specification, design, and/or any components may not be printed immediately but until the following revision of the manual.
- When the manual refers to "**Valve Zero / Zero**" means the final valve position upon pneumatic pressure has been fully exhausted from positioner's OUT1 port. The valve zero position may differ between linear direct and reverse actions. (DA/RA)
- The manual should not be duplicated or reproduced for any purpose without prior approval from Young Tech Co., Ltd, Gimpo-si, South Korea.
- In case of any other problems that are not stated in this manual, please make immediate contact to Young Tech co., Ltd.
- Positioner is an accessory of the control valve, so please make sure to read the applicable instruction manual of the control valve prior to installation and operation.

1.2 Manufacturer Warranty

- For the safety, it is important to follow the instructions in the manual. Manufacturer will not be responsible for any damages caused by user's negligence.
- Any modifications or repairs to the product may only be performed if expressed in this manual. Injuries and physical damages caused by customer's modifying or repairing the product without a prior consultation with Young Tech co., Ltd will not be compensated. If any alterations or modifications are necessary, please contact Young Tech Co., Ltd directly.
- Manufacturer warrants the product from the date of original purchase of the product for eighteen (18) months, except as otherwise stated.
- Manufacturer warranty will not cover products that have been subjected to abuse, accidents, alterations, modifications, tampering, negligence, misuse, faulty installation, lack of reasonable care, repair or service in any way that is not contemplated in the documentation for the product, or if the model or serial number has been altered, tampered with, defaced or removed; damages that occurs in shipment, due to act of

God, failure due to power surge, or cosmetic damage. Improper or incorrectly performed maintenance will void this limited warranty.

- For detailed warranty information, please contact the corresponding local Young Tech Co., Ltd office or main office in South Korea.

1.3 Explosion Proof Warning (Only for Intrinsic safety type positioners)

Please ensure the unit is being used and installed in conformity with local, regional, and national explosion proof within the proper safety barrier environment.

- Refer to “2.6 Certifications”
- Explosion proof type of cables and gaskets should be used, when explosion gases are present at the installation site.
- Positioner has 2 ports for power connection. Explosion proof type wires and packing should be used. Blind plug is required when any port is not being used.
- Ring terminal with surface area of more than 0.195mm² with M4 spring washer should be used to connect the power.
- For external ground terminal, ring terminal with surface area of more than 5.5mm² should be used.
- Wiring in these applications shall utilize appropriate methods for Class I, Division 2 / Zone 2
- Substitution of components may impair intrinsic safety.
- Substitution of components may impair suitability for Class I, Division 2.
- EXPLOSION HAZARD. Do not connect or disconnect wiring unless all sources of power have been removed or the area is known to be non-hazardous.
(French) RISQUE D'EXPLOSION. Ne pas raccorder ou débrancher le câblage à moins Toutes les sources d'énergie ont été enlevées ou la zone est connue pour être non dangereux.
- The enclosure of models YT-3300, YT-3301, and YT-3303 contains aluminum, which is considered to constitute a potential risk of ignition when subjected to impact or friction. Care must be used during installation in locating this equipment to prevent impact or friction
- Parts of the enclosure are made of non-metallic materials. To prevent the risk of Electrostatic sparking, clean the enclosure only with a damp cloth.
- The product must be installed in such a manner as to minimize the risk of impact or friction with other metal surfaces.
- For Intrinsically Safe installations, the product must be connected to suitably rated intrinsically safe equipment, and must be installed in accordance with applicable intrinsically safe installation standards.



2. Product Description

2.1 General

YT-3300 / 3350 / 3303 / 3301 series Smart Valve Positioner accurately controls valve stroke in response to an input signal of 4~20mA from the controller. Built-in micro-processor optimizes the positioner's performance and provides unique functions such as **Auto-Calibration, PID Control, and HART Protocol Communications.**

2.2 Main Features and Functions

- LCD display enables users to monitor the positioner status.
- User will easily understand the method of using 4 buttons because it work same in all versions of firmware interfaces.
- When unexpected situation like momentary blackout happens, our positioner boot-time only take 0.5 second and this can minimize the travel of valve which consequentially increase the safety of system.
- Positioner operates normally even there are sudden changes in supply pressure and / or high vibration environment.
- YT-3301 remote positioner is stronger on high temperature and vibration environment because it is separated into feedback sensor and positioner.
- The method of Auto Calibration is very simple.
- As an advantage of having very low air consumption, It could greatly reduce operating costs in large-scale plants.
- It is compatible with most of controllers.
- Orifices can be installed even in the field to minimize the hunting occurrence and optimize operating conditions.
- Various information about positioner can be processed by HART communication (HART option)
- Valve system becomes more stable by outputting analog feedback signal.
- Different valve characteristics can be adjusted – Linear, Quick Open, Equal Percentage, and Custom which user can make 18 points characterizations.
- Tight Shut – Close and Shut - Open can be set.
- PID parameters can be adjusted in the field without any additional communicator.
- A/M switch can be used to direct supply air to the actuator or to manually operate the positioner or valve without any signal.
- Split range 4~12mA or 12~20mA can be set.
- Operating temperature for sensor module of YT-3301 is -40 ~ 120°C.
Operating temperature for positioners is -30 ~ 85°C or -40 ~ 85°C (Please check certified explosion proof temperature)
- Hand calibration function can set Zero point or End point manually.
- It has IP66, Type 4X(FM) protection grade.

- Epoxy polyester powder coating resists the corrosion process. (except YT-3350).
- Maintenance of the positioner is easy because of modularized inner structure.
- SIL2 certified.(For more information, see SIL Safety Instruction on homepage)

2.3 Label Description

- MODEL NUMBER: Indicates the model number and any options of the positioner.
- EXPLOSION PROOF: Indicates certified explosion proof grade.
- INPUT SIGNAL: Indicates input signal range.
- OPERATING TEMP.: Indicates the allowable operating temperature.
- AMBIENT TEMP.: Indicates the allowable ambient temperature for explosion proof.
- SUPPLY PRESSURE: Indicates the supply pressure range.
- Ui, li, Pi, Ci, Li: Indicates the allowable electrical data in the certificate.
ATEX: Ui = 28 V, li = 93 mA, Pi = 651 mW, Ci = 0.6 nF, Li = 10 μH
FM: Ui = 28 V, li = 93 mA, Pi = 651 mW, Ci = 0.55 nF, Li = 12 μH
You can also see the details in the certificate.
- SERIAL NUMBER: Indicates unique serial number.
- YEAR : Indicates manufactured year.

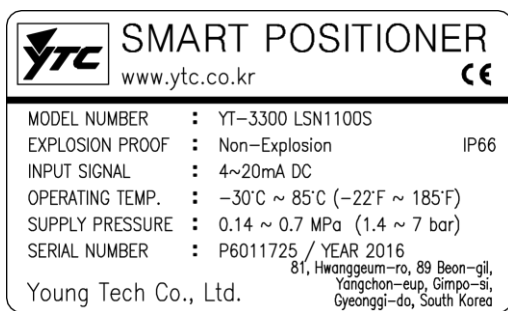


Fig. L-1: YT-3300 / 3303 / 3301 Non-explosion proof

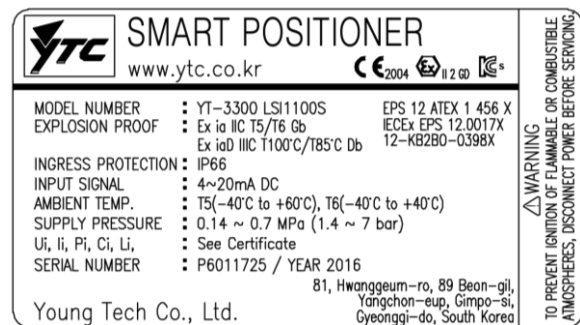


Fig. L-2: YT-3300 / 3303 / 3301 Intrinsic safety type (ATEX, IECEx, KCs)

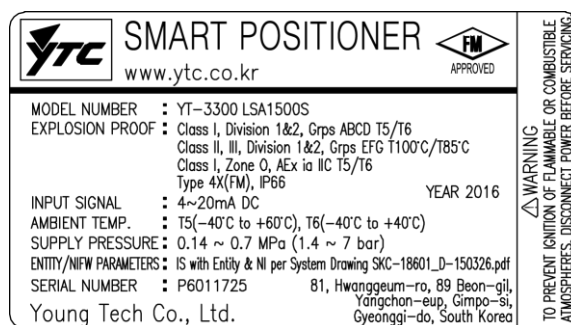


Fig. L-3: YT-3300 / 3303 / 3301 / 3302 Intrinsic safety type (FM)

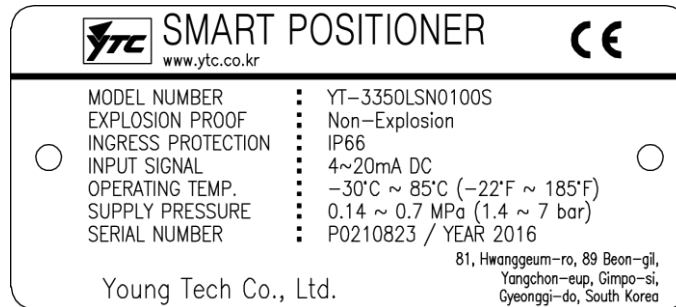


Fig. L-4: YT-3350 Non-explosion proof

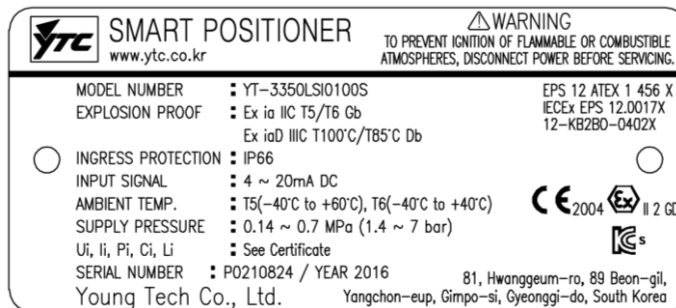


Fig. L-5: YT-3350 Intrinsic safety type (ATEX, IECEX, KCs, etc.)

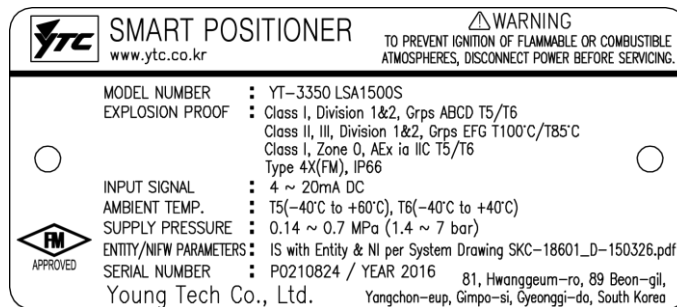


Fig. L-6: YT-3350 Intrinsic safety type (FM)

2.4 Product Number

2.4.1 YT-3300 / 3350 series follows suffix symbols as follows.

YT-3300 / 3350 1 2 3 4 5 6 7 8

1	Motion Type	L: Linear (positioner is attached the right yoke of actuator.) R: Rotary
2	Acting type	S: Single D: Double
3	Explosion Proof	N: Non-Explosion i: ATEX, IECEx, KCs, NEPSI: Ex ia IIC T5/T6 Gb, Ex iaD IIIC T100°C/T85°C Db, IP66 A: FM & CSA(pending) : Class I, Division 1&2 Groups ABCD T5/T6 Class II, Division 1&2 Groups EFG T100°C/T85°C; Class III Class I, Zone 0, AEx ia IIC T5/T6, Ex ia IIC T5/T6 Ga; Ex tb IIIC T100°C/T85°C Db Type 4X(FM), IP66
4	Lever Type	0: 10 ~ 40 mm (Standard type) 1: 20 ~ 100 mm (Standard type) 2: 90 ~ 150 mm (Standard type) 3: 16 ~ 30 mm (Adapter type) 4: 16 ~ 60 mm (Adapter type) 5: 16 ~ 100 mm (Adapter type) 6: 90 ~ 150 mm (Adapter type)
	Linear	
	Rotary	1: M6 x 34L 2: M6 x 63L 3: M8 x 34L 4: M8 x 63L 5: Namur
5	Conduit - Air Connection Type	1: G 1/2 - PT 1/4 2: G 1/2 - NPT 1/4 (YT-3350 is available for No. 2 ONLY) 3: G 1/2 - G 1/4 4: M20(Adapter type) - NPT 1/4 5: NPT 1/2 - NPT 1/4
6	Communication	0: None 2: + HART Communication
7	Option	0: None 1: + Position Transmitter 2: + Limit Switch(Mechanical Type) 3: + Limit Switch(Proximity Type) 4: + Position Transmitter and Limit Switch (Mechanical Type) 5: + Position Transmitter and Limit Switch (Proximity Type)
8	Operating Temp.	S: -30°C ~ 85°C (-22°F ~ 185°F) L: -40°C ~ 85°C (-40°F ~ 185°F)

2.4.2 YT-3303 series follows suffix symbols as follows.

YT-3303

1	2	3	4	5	6	7	8
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1	Motion Type	L : Linear (positioner is attached the left yoke of actuator.) R : Rotary
2	Acting type	S : Single D : Double
3	Explosion Proof	N : Non-Explosion i : ATEX, IECEX, KCs, NEPSI: Ex ia IIC T5/T6 Gb, Ex iaD IIIC T100°C/T85°C Db, IP66 A : FM & CSA(pending) : Class I, Division 1&2 Groups ABCD T5/T6 Class II, Division 1&2 Groups EFG T100°C/T85°C; Class III Class I, Zone 0, AEx ia IIC T5/T6, Ex ia IIC T5/T6 Ga; Ex tb IIIC T100°C/T85°C Db Type 4X(FM), IP66
4	Lever Type	1 : 10 ~ 40 mm 2 : 20 ~ 70 mm 3 : 50 ~ 100 mm 4 : 100 ~ 150 mm
	Linear	
	Rotary	1 : M6 x 34L 2 : M6 x 63L 3 : M8 x 34L 4 : M8 x 63L 5 : Namur
5	Conduit – Air Connection Type	1 : G 1/2 - PT 1/4 2 : G 1/2 - NPT 1/4 3 : G 1/2 - G 1/4 4 : M20(Adapter type) - NPT 1/4 5 : NPT 1/2 - NPT 1/4
6	Communication	0 : None 2 : + HART Communication
7	Option	0 : None 1 : + Position Transmitter
8	Operating Temp.	S : -30°C ~ 85°C (-22°F ~ 185°F) L : -40°C ~ 85°C (-40°F ~ 185°F)

2.4.3 YT-3301 series follows suffix symbols as follows.

YT-3301 1 2 3 4 5 6 7 8 9

1	Motion Type	L : Linear R : Rotary
2	Acting type	S : Single D : Double
3	Explosion Proof	N : Non-Explosion i : ATEX, IECEX, KCs, NEPSI: Ex ia IIC T5/T6 Gb, Ex iaD IIIC T100°C/T85°C Db, IP66 A : FM & CSA(pending) : Class I, Division 1&2 Groups ABCD T5/T6 Class II, Division 1&2 Groups EFG T100°C/T85°C; Class III Class I, Zone 0, AEx ia IIC T5/T6, Ex ia IIC T5/T6 Ga; Ex tb IIIC T100°C/T85°C Db Type 4X(FM), IP66
4	Lever Type	1 : 10 ~ 40 mm 2 : 20 ~ 70 mm 3 : 50 ~ 100 mm 4 : 100 ~ 150 mm
	Linear	
	Rotary	5 : Namur
5	Conduit – Air Connection Type	1 : G 1/2 - PT 1/4 2 : G 1/2 - NPT 1/4 3 : G 1/2 - G 1/4 4 : M20(Adapter type) - NPT 1/4 5 : NPT 1/2 - NPT 1/4
6	Communication	0 : None 2 : + HART Communication
7	Option	0 : None 1 : + Position Transmitter
8	Operating Temp.	S : -30°C ~ 85°C (-22°F ~ 185°F) L : -40°C ~ 85°C (-40°F ~ 185°F)
9	Cable Length ¹⁾	1 : 5m 2 : 10m 3 : 15m 4 : 20m

¹⁾ Maximum cable length is 20m.

2.5 Product Specification

2.5.1 YT-3300 / 3303 / 3350 Specification

Model		YT-3300 / 3303		YT-3350	
Housing Material		Aluminum Die-casting		Stainless Steel 316	
Motion Type		Linear	Rotary	Linear	Rotary
Acting Type		Single / Double			
Input Signal		4~20mA DC			
Minimum Current Signal		3.2mA(Standard), 3.8mA(Hart Included)			
Supply Pressure		0.14 ~ 0.7 MPa (1.4 ~ 7 bar)			
Stroke		10 ~ 150 mm	0 ~ 90°	10 ~ 150 mm	0 ~ 90°
Impedance		Max. 500Ω @ 20mA DC			
Air Connection		PT, NPT, PF(G) 1/4		NPT 1/4	
Gauge Connection		PT, NPT 1/8		NPT 1/8	
Conduit Entry		G(PF) 1/2 or NPT 1/2 or M20*1.5P		G(PF) 1/2	
Ingress Protection		IP66, Type 4X(FM)			
Explosion Proof		ATEX, IECEx, KCs, NEPSI: Ex ia IIC T5/T6 Gb, Ex iaD IIIC T100°C/T85°C Db, IP66 FM & CSA(Pending) : Class I, Division 1&2 Groups ABCD T5/T6 Class II, Division 1&2 Groups EFG T100°C/T85°C; Class III Class I, Zone 0, AEx ia IIC T5/T6, Ex ia IIC T5/T6 Ga; Ex tb IIIC T100°C/T85°C Db			
Operating Temperature	Standard Type	-30°C ~ 85°C (-22°F ~ 185°F)			
	Low Temp. Type	-40°C ~ 85°C (-40°F ~ 185°F)			
LCD Operating Temperature		-30°C ~ 85°C (-22°F ~ 185°F)			
Ambient Temperature Of Explosion proof	T5	-40°C ~ 60°C (-40°F ~ 140°F)			
	T6	-40°C ~ 40°C (-40°F ~ 104°F)			
Linearity		±0.5% F.S.			
Hysteresis		±0.5% F.S.			
Sensitivity		±0.2% F.S.			
Repeatability		±0.3% F.S.			
Flow Capacity		70 LPM (Sup.=0.14 MPa)			
Air Consumption		Below 2 LPM (Sup.=0.14 MPa @ idle)			
Output Characteristic		Linear, Quick Open, EQ%, User Set (16 points)			
Vibration		No Resonance up to 100Hz @ 6G			
Humidity		5-95% RH @ 40°C			
Communication (Option)		HART Communication (Rev. 7)			
Feedback Signal (Option)		4~20mA (DC 9~28V)			
Weight		2 Kg (4.4 lb)		5.1 Kg (11.2 lb)	
Painting		Epoxy Polyester Powder Coating		-	



Tested under ambient temperature of 20°C, absolute pressure of 760mmHg, and humidity of 65%.

Please contact Young Tech Co., Ltd for detailed testing specification.

2.5.2 YT-3301 Specification

Model		YT-3301 / 3302	
Housing Material		Aluminum Die-casting	
Motion Type		Linear	Rotary
Acting Type		Single / Double	
Input Signal		4~20mA DC	
Minimum Current Signal		3.2mA(Standard), 3.8mA(Hart Included)	
Supply Pressure		0.14 ~ 0.7 MPa (1.4 ~ 7 bar)	
Stroke		10 ~ 150 mm	0 ~ 90°
Impedance		Max. 500Ω @ 20mA DC	
Air Connection		PT, NPT, PF(G) 1/4	
Gauge Connection		PT, NPT, 1/8	
Conduit Entry		G(PF) 1/2 or NPT 1/2 or M20*1.5P	
Ingress Protection		IP66, Type 4X(FM)	
Explosion Proof		ATEX, IECEx, KCs, NEPSI: Ex ia IIC T5/T6 Gb, Ex iaD IIIC T100°C/T85°C Db, IP66 FM & CSA(Pending) : Class I, Division 1&2 Groups ABCD T5/T6 Class II, Division 1&2 Groups EFG T100°C/T85°C; Class III Class I, Zone 0, AEx ia IIC T5/T6, Ex ia IIC T5/T6 Ga; Ex tb IIIC T100°C/T85°C Db	
Operating Temperature	Sensor		-40°C ~ 120°C (-40°F ~ 248°F)
	Body	Standard	-30°C ~ 85°C (-22°F ~ 185°F)
		Low temp.	-40°C ~ 85°C (-40°F ~ 185°F)
LCD Operating Temperature		-30°C ~ 85°C (-22°F ~ 185°F)	
Ambient Temperature Of Explosion proof	T5	-40°C ~ 60°C (-40°F ~ 140°F)	
	T6	-40°C ~ 40°C (-40°F ~ 104°F)	
Linearity		±0.5% F.S.	
Hysteresis		±0.5% F.S.	
Sensitivity		±0.2% F.S.	
Repeatability		±0.3% F.S.	
Flow Capacity		70 LPM (Sup.=0.14 MPa)	
Air Consumption		Below 2 LPM (Sup.=0.14 MPa @ idle)	
Output Characteristic		Linear, Quick Open, EQ%, User Set (16 points)	
Vibration		No Resonance up to 100Hz @ 6G	
Humidity		5-95% RH @ 40°C	
Communication (Option)		HART Communication (Rev. 7)	
Feedback Signal (Option)		4~20mA (DC 9~28V)	
Weight	Positioner		2.2 Kg (4.9 lb)
	Sensor	0.6 Kg (1.2 lb)	1.0 Kg (2.1 lb)
	Cable(5M)	0.6 Kg (1.3 lb)	
Painting		Epoxy Polyester Powder Coating	



Tested under ambient temperature of 20°C, absolute pressure of 760mmHg, and humidity of 65%.

Please contact Young Tech Co., Ltd for detailed testing specification.

2.6 Certifications

※ All certifications below are posted on YTC homepage(www.ytc.co.kr).

➤ **KCs (Korea)**

Type : Intrinsic safety

Rating : Ex ia IIC T5/T6, Ex iaD T100°C/T85°C, IP66

Certification No. : 12-KB2BO-0398X(YT-3300)

12-KB2BO-0399X(YT-3300+LS(Dry contact))

14-KB2BO-0333X(YT-3300+LS(Non-contact))

12-KB2BO-0402X(YT-3350)

12-KB2BO-0401X(YT-3350+LS(Dry contact))

14-KB2BO-0334X(YT-3350+LS(Non-contact))

14-KB2BO-0335X(YT-3303)

12-KB2BO-0400X(YT-3301)

Ambient temperature : -40 ~ +60°C (T5/T100°C), -40 ~ +40°C (T6/T85°C)

➤ **ATEX**

Type : Intrinsic safety

Rating : II 2G Ex ia IIC T5/T6 Gb, II 2D Ex ia IIIC T100°C/T85°C Db, IP6X

Certification No. : EPS 12 ATEX 1 456 X

Ambient temperature : -40 ~ +60°C (T5), -40 ~ +40°C (T6)

➤ **IECEX**

Type : Intrinsic safety

Rating : Ex II 2G Ex ia IIC T5/T6 Gb, Ex II 2D Ex ia IIIC T100°C/T85°C Db, IP6X

Certification No. : IECEX EPS 12.0017X

Ambient temperature : -40 ~ +60°C (T5/T100°C), -40 ~ +40°C (T6/T85°C)

➤ **NEPSI**

Type : Intrinsic safety

Rating : Ex ia IIC T5/T6

Certification No. : GYJ11.1599X

➤ **TRCU**

Type : Intrinsic safety

Rating : 1Ex ia IIC «T6 ... T5» Gb X, Ex ia IIIC «T85 ° C ... T100 ° C» Db X

Certification No. : RU C-KR.MIO62.B.04756

Ambient temperature : -40 ~ +60°C (T5/T100°C), -40 ~ +40°C (T6/T85°C)

➤ **FM**

Rating : Class I, Div 1, Groups ABCD

Class I, Zone 0 AEx ia IIC

Class II/III, Div 1, Groups EFG

Class I, II, III, Div 2, Groups ABCDEFG

NEMA Type 4, IP66

Certificate No.: FM16US0268X

Ambient temperature : -40 to +60°C(T5), -40 to +40°C(T6)

شرکت فنی مهندسی کنترل تک فعال در زمینه ی فروش ، مشاوره فنی رایگان و آموزش ابزار دقیق