VALVE POSITION MONITOR

APL-SERIES

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Valve automation leader HKC

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HCAG-APL-16 Rev.1

Features

- Solid and flexible design
- Aluminium die-casting housing and polyester powder coating
- Quick-set cam
- Visual dome position indicator
- Spring loaded splined cam
  - No adjustment required after the initial setting
  - Easy setting without tool
- Dual cable entries
- Captive cover bolts (APL-5, APL-7, APL-8)
  - Designed to prevent from losing them
- Easy mounting bracket
- NAMUR standard stainless steel shaft and bracket

Description

Providing accurate and reliable valve position monitoring, the APL-series limit switch boxes are designed for quarter turn valve applications (0° to 90°) used in many industries:

- Chemical & petrochemical
- Municipal wastewater
- Power plant
- Oil refinery
- Marine
- General industry

A wide range of product with many switch and other accessory options cover various customer needs: cost-effective, corrosive/ hostile environments, enclosure standards (IP67, IP68, NEMA 4, 4X, 6, flame-proof, intrinsic safety), higher/ lower operating temperature, multiple cable entries, 3-way or 5-way valve applications, current position signalling, solenoid valve, and many more.

The housings of standard APL-series are die cast aluminium. To provide high corrosion resistance, they are chromate coated and polyester powder coating is further applied. The housing of APL-5 is available in either aluminium die cast, 316 stainless steel, or 316L stainless steel.

With Pre-wired switches and pre-set cams allow quick and easy installation. APL-series has spring loaded splined cams which can be adjusted without requiring any tools. Once the initial setting has been done, there is no need for further adjustment. Also, a full line of NAMUR standard mounting brackets are availalbe for all APL-series.

Standard Specification

Model		APL-2	APL-3	APL-4	APL-5	APL-7	APL-8
							
Enclosure	Material	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium	Aluminium
	IP rating	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
	NEMA rating	NEMA 4, 4X	NEMA 4, 4X	NEMA 4, 4X, 6	NEMA 4, 4X, 6	-	-
Certified	ATEX, IECEx	-	-	Ex d IIB T6 Gb	Ex d IIC T6	Ex d IIC T5	Ex d IIC T6
	CSA	-	-	Cl.1, Div.1, Gr.C,D	Cl.1, Div.1, Gr.B,C,D	-	-
	EAC	-	General purpose	1 Ex d IIB T6 Gb X	1 Ex d IIC T6 Gb X	-	-
	NEPSI	-	-	-	Ex d IIC T6 Gb	-	-
Cable entries		2 x NPT1/2"	2 x NPT1/2"	2 x NPT3/4"	2 x NPT3/4"	3 x NPT3/4"	4 x NPT3/4"
Ambient temp.		-20 to +80 °C	-20 to +80 °C	-20 to +80 °C / -20 to +60 °C (flame proof)	-20 to +80 °C / -20 to +60 °C (flame proof)	-20 to +80 °C / -20 to +60 °C (flame proof)	-20 to +80 °C / -20 to +60 °C (flame proof)
Terminal strips (0.08 - 2.5 mm²)		8 points	8 points	8 points	8 points	8 points	8 points
Position indicator (0° - 90°)		Open: yellow, Close: red	Open: yellow, Close: red	Open: yellow, Close: red	Open: yellow, Close: red	Open: yellow, Close: red	Open: yellow, Close: red
Switches		2 x mechanical switch / 2 x proximity sensor	2 x mechanical switch / 2 x proximity sensor	2 x mechanical switch / 2 x proximity sensor	2 x mechanical switch / 2 x proximity sensor	2 x mechanical switch / 2 x proximity sensor	2 x mechanical switch / 2 x proximity sensor
Coating		Chromate, polyester powder coating	Chromate, polyester powder coating	Chromate, polyester powder coating	Chromate, polyester powder coating	Chromate, polyester powder coating	Chromate, polyester powder coating
Color		Black	Black	Black	Black	Black	Black

Optional Specification

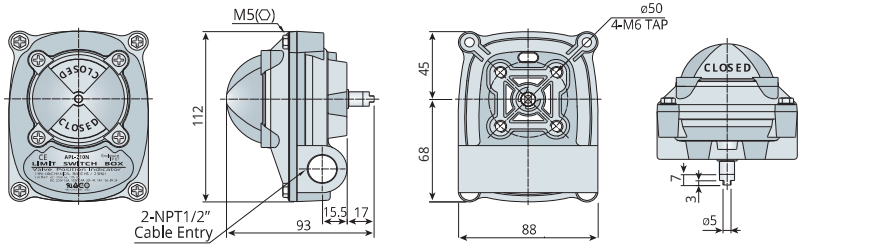
Model		APL-2	APL-3	APL-4	APL-5	APL-7	APL-8
Enclosure	Material	-	-	-	316 stainless steel / 316L stainless steel	-	-
	IP rating	IP 68	IP 68	IP 68	IP 68	IP 68	IP 68
Explosion Proof	ATEX, IECEx	-	-	-	Ex ia IIC T6 / Ex tb IIIC T85°C IP67	-	-
Cable entries		2 x (PF1/2", PT1/2", M20, PG13.5)	2 x (PF1/2", PT1/2", M20, PG13.5)	2 or 4* x (PF3/4", PT3/4", M20, M25)	2 x (PF3/4", PT3/4", M20, M25)	3 x (PF3/4", PT3/4", M20, M25)	4 x (PF3/4", PT3/4", M20, M25)
Ambient temp.		-	-40 to +80 °C (low) -20 to +150 °C (high)	-40 to +80 °C (low)	APL-52X : -25~60℃ -53X : -40~60℃ -5HX : -50~60℃	-	-
Terminal strips (0.08 - 2.5 mm²)		-	16 points	20 points	-	-	-
Position indicator		Three positions close: red / open: green	Three positions close: red / open: green	Three positions close: red / open: green	Three positions close: red / open: green	Three positions close: red / open: green	Three positions close: red / open: green
Switches		-	4 x mechanical switch / 4 x proximity sensor	4 x mechanical switch / 4 x proximity sensor	4 x mechanical switch / 4 x proximity sensor	4 x mechanical switch / 4 x proximity sensor	4 x mechanical switch / 4 x proximity sensor
Potentiometer		-	1 kΩ (standard) 5 kΩ, 0-10 kΩ	1 kΩ (standard) 5 kΩ, 0-10 kΩ	1 kΩ (standard) 5 kΩ, 0-10 kΩ	1 kΩ (standard) 5 kΩ, 0-10 kΩ	1 kΩ (standard) 5 kΩ, 0-10 kΩ
Current output signal unit		-	4-20 mA dc 12.5-37 V dc (24 V typical)	4-20 mA dc 12.5-37 V dc (24 V typical)	4-20 mA dc 12.5-37 V dc (24 V typical)	4-20 mA dc 12.5-37 V dc (24 V typical)	4-20 mA dc 12.5-37 V dc (24 V typical)
Coating		Additional nano coating	Additional nano coating	Additional nano coating	Additional nano coating	Additional nano coating	Additional nano coating
Color		Red, green, blue, yellow, silver	Red, green, blue, yellow, silver	Red, green, blue, yellow, silver	Red, green, blue, yellow, silver	Red, green, blue, yellow, silver	Red, green, blue, yellow, silver

*Note: APL-4 with more than 2 cable entries does not support explosion proof functicn.

Dimension

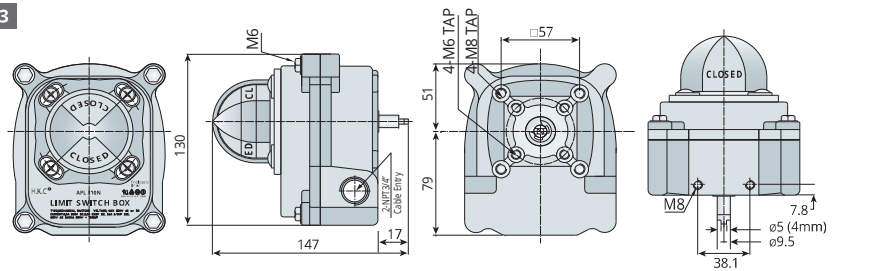
Unit: mm

APL-2



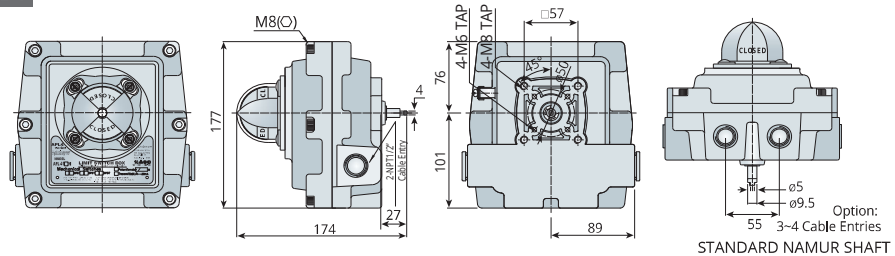
STANDARD NAMUR SHAFT

APL-3



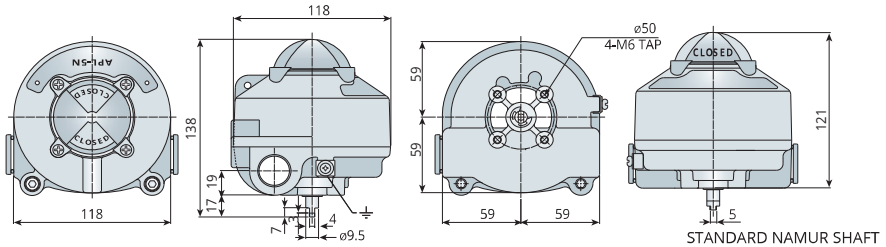
STANDARD NAMUR SHAFT

APL-4



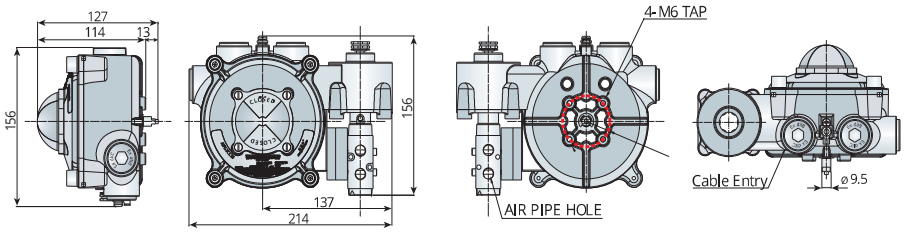
STANDARD NAMUR SHAFT

APL-5



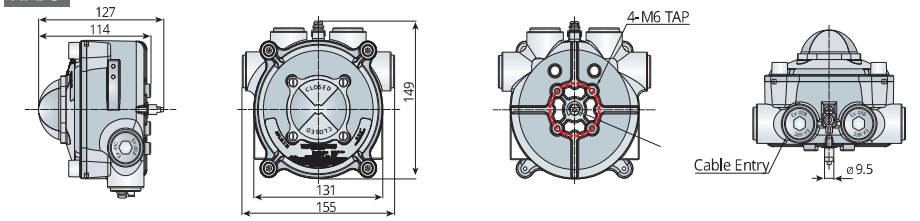
STANDARD NAMUR SHAFT

APL-7



STANDARD NAMUR SHAFT

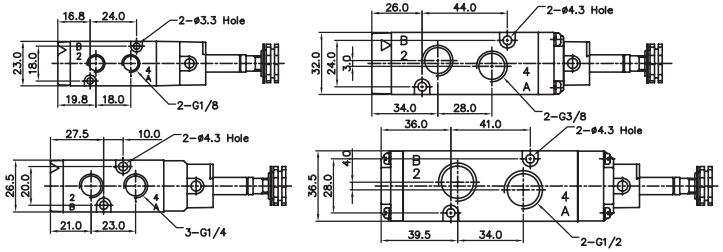
APL-8



STANDARD NAMUR SHAFT

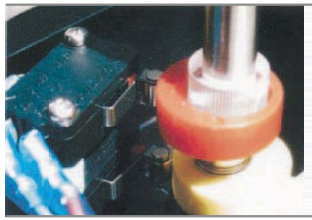
APL-7 Single Coil Solenoid Valve

Operating pressure	1.5 to 10 bar
Valve material	Aluminium
Seal	NBR
Ambient temp.	+5 to +60 °C
Coil voltage	ac 110 V, ac 220 V, dc 24 V



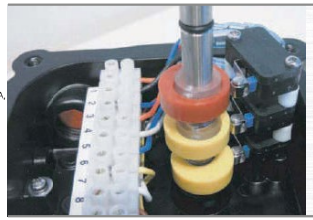
Switch Specification

Mechanical switch



Standard switches

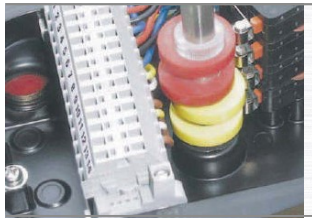
- 2 x SPDT switches
- Contact arrangement:
  125,250 V ac 16 A, 250 V dc 0.3 A,
  125,250 V ac 0.6 A, 1/2 HP
- Operating frequency
  -Max. 600 operations/min (mechanical)
  -Max. 60 operations/min (electrical)



Optional switches

- 3 x SPDT switches
- Contact arrangement:
  125,250 V ac 16 A,
  250 V dc 0.3 A,
  125 V dc 0.6 A,
  125,250 V ac 1/2 HP

Except APL-2



Optional switches

- 4 x SPDT swtiches
- Contact arrangement:
  125,250 V ac 16 A,
  250 V dc 0.3 A,
  125 V dc 0.6 A,
  125,250 V ac 1/2 HP

Except APL-2

Optional switches

- 2 x DPDT switches
- Contact arrangement:
  125/250 V ac 16 A,
  1 HP 125 V ac,
  2 HP 250 V ac,
  250 V dc 0.5 A

Except APL-2

Proximity sensor

NJ2-V3-N P & F (intrinsically safe)

- Inductive proximity sensor
- Voltage range: 8 V dc
- Sensing range: 2 mm
- Anbient temperature : -25 to +60℃

PS17-5DNU

- Inductive proximity sensor
- Voltage range: 10~30 V dc
- Sensing range: 5 mm

Except APL-2

Optional sensor

- NBB2-V3-E2/E3(PNP): 10~30 V dc
- NBB2-V3-E0(NPN): 10~30 V dc
- NBB2-V3-Z4/Z5: 5~60 V dc
- Anbient temperature : -25 to + 60℃

APL 4 Proximity sensor

- NJ2-12GM-40-E2: 10~60 V dc
- NJ4-12GM-40-E2: 10~60 V dc
- NBB2-12GM-40: 6~60 V dc

Except APL-2, 3, 5, 7, 8

Reed proximity sensor

2 x SPST switches

- Contact form: NO. NC
- Contact rating: 10 W Max.
- Switching voltage: 200 V dc Max.
- Switching current: 1 A Max.
- Breakdown voltage: 250 V dc Min.
- Contact resistance (initial): 0.3 Ω Max.
- Electrical life: 10^7 (6 V dc, 10 mA)
- MK 21 (APL-53X)
  Ambient temperature : -40 to +60℃
- Honey well 11/12/13 SX (APL-5HX)
  Ambient temperature : -50 to 60℃

2 x SPDT switches

- Contact form: NO. NC
- Contact rating: 5 W Max.
- Switching voltage: 175 V dc Max.
- Switching current: 0.25 A Max.
  (option : 1.5 A Max @60 V dc Max.)
- Breakdown voltage: 200 V dc Min.
- Contact resistance (initial): 0.3 Ω Max.
- Electrical life: 10^7 (12 V dc, 10 mA)

Bracket (NAMUR Standard)

Shape			
Model (size)	MBP-50 (25 X 50 H : 20) MBP-100 (30 X 80 H : 20) MBP-200 (30 X 80 H : 30) MBP-300 (30 X 130 H : 30) MBP-400 (30 X 130 H : 50)	MB-P-O-1C (30 X 80 H : 20) MB-P-O-1S (30 X 80 H : 20) MB-P-O-2C (30 X 80 H : 30) MB-P-O-2S (30 X 80 H : 30)	MB-P-O-3C (30 X 130 H : 30) MB-P-O-3S (30 X 130 H : 30) MB-P-O-4C (30 X 130 H : 50) MB-P-O-4S (30 X 130 H : 50)

The last letter of the model name: C means carbon steel plate, S means stainless steel plate.

※

Ordering Information

APL - 3 10 N

Model (Enclosure type)

2: Standard (IP67, NEMA 4X)
3: Standard (IP67, NEMA 4X)
4: Flame proof (Ex d IIB T6, Cl.1, Div.1, Gr.C-D, IP67, NEMA 4, 4X, 6)
5: Flame proof (Ex d IIC T6, Cl.1, Div.1, Gr.B-D, IP67, NEMA 4, 4X, 6), Dust ignition proof (Ex tb IIIC T85°C)
With proximity sensor (option) - Intrinsic safety (Ex ia IIC T6) : APL-520 only
7: Flame proof (Ex d IIC T5) with solenoid valve and 3 cable entries
8: Flame proof (Ex d IIC T6) with 4 cable entries

Enclosure Material

N : Aluminum alloy
S : Stainless steel (APL-5 only)

Switch type

Mechanical switch	Proximity sensor	Reed type proximity sensor	Low temperature sensor
10 2 - SPDT	20 P&F. NJ2-V3-N(-25~+60℃)	30 MS-B 301	5HX
11 3 - SPDT	21 Autonics. PS17-5DNU	43X (CSA, MK21, -20~60℃)	(CSA, Honeywell, -50~+60℃)
12 4 - SPDT	22 P&F. NJ4-12GM-N(-25~+60℃)	53X (CSA, MK21, -40~60℃)	
13 2 - SPST	23 P&F. NBB2-V3(-25~+60℃)		
14 2 - DPDT	25 P&F. NJ2-V3-N + Potentiometer(-25~+60℃)		
15 2 - SPDT + Potentiometer	26 P&F. NJ2-V3-N + Signal unit (4~20 mA)(-25~+60℃)		
16 2 - SPDT + Signal unit (4~20 mA)			