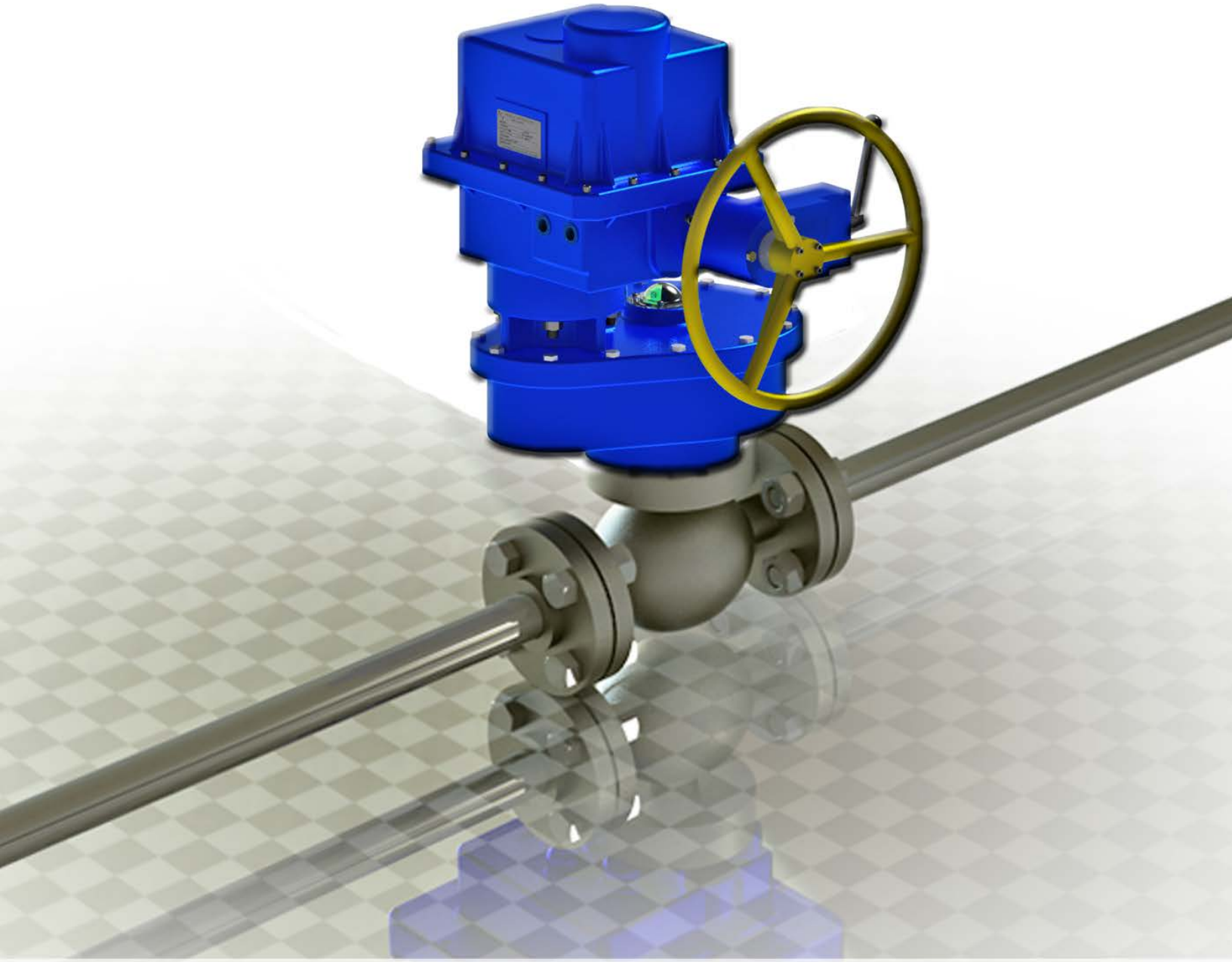
INDELAC CONTROLS

MADE IN U.S.A PRODUCT

American Made Actuators & Controls



PRECISION ENGINEERING FOR PRECISION AUTOMATION & CONTROL

1-800-662-9424
www.INDELAC.com

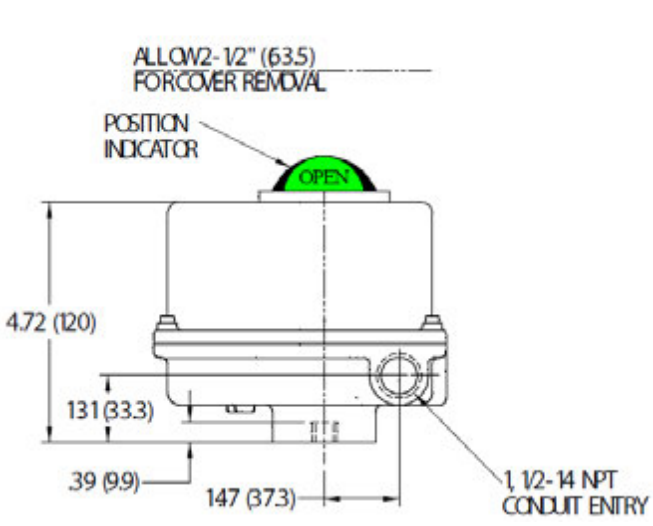
INDELAC MODEL
R SERIES

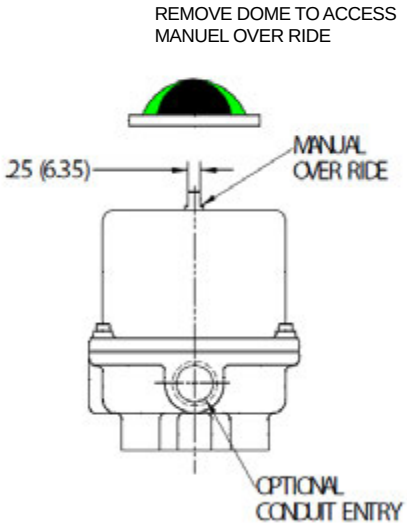
(100 IN-LB) NEMA 4

The R series compact electric rotary actuator was specifically designed for small ball valve and damper applications. This heavy-duty reversing actuator develops 100 In-lbs of torque and rotates from 0° to 90° in 2.5 seconds. The spur gear drive train has been designed for severe applications and can withstand stall conditions without suffering gear failure. The Industrial grade aluminum enclosure meets NEMA 4 specifications and has a thermally bonded ultraviolet-resistant polyester powder coating that not only enhances its appearance but also offers a high degree of corrosion resistance which protects against chemicals and solvents.

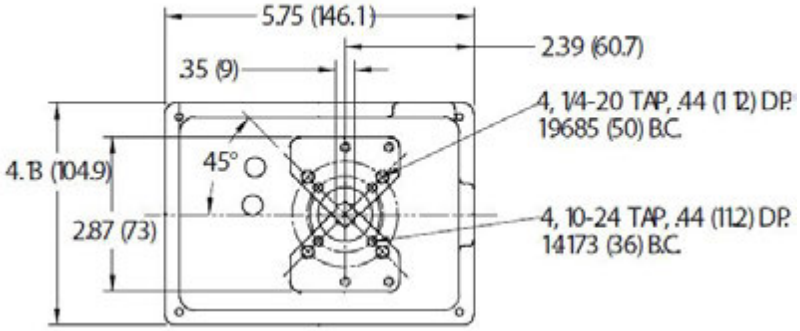
SPECIFICATIONS	
TORQUE	100 In-Lb (11.30 Nm)
CYCLE TIME	2.5 sec. / 90° 115 Vac & 230 Vac 3.0 sec. / 90° 12 Vdc & 24 Vdc / Vac
DUTY CYCLE	25% (standard) 115 Vac & 230 Vac 75% 12 Vdc & 24 Vdc / Vac
ENCLOSURE	NEMA 4 standard, CSA certified
COATING	Thermally bonded polyester powder
POSITION IND.	Visual indicator Wired for light indication
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac
LUBRICATION	Permanent
WEIGHT	6 Lbs
INSTALLATION	Universal
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below
MODULATING	Built in SD enclosure
OVERRIDE	Manual, Non declutching Not available on DC voltage

TECHNICAL DRAWINGS & WIRING DIAGRAM

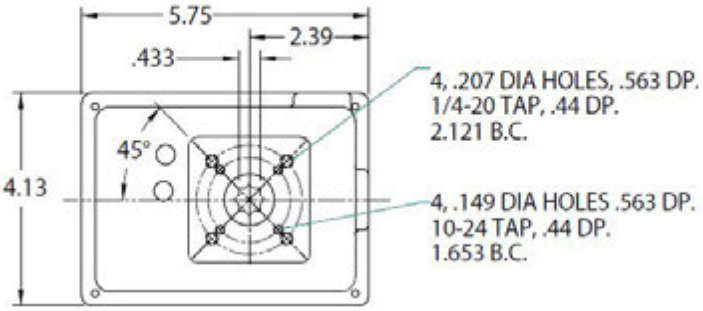




MOUNTING PAD
ISO 5211 F03 Star drive
ISO 5211 F04 Star drive
ISO 5211 F03/04 Star drive



ISO 5211 F03

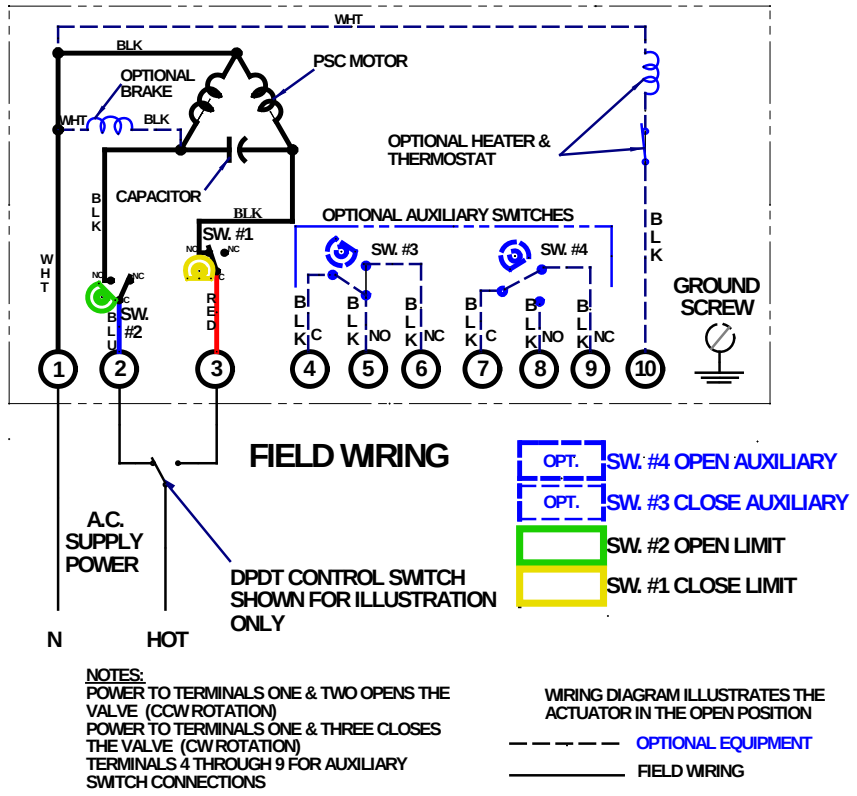


ISO 5211 F04

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	0.64
	LR	1.5
24 Vac	FL	0.4
	LR	2.4
24 Vdc	FL	0.4
	LR	2.4
12 Vdc	FL	0.6
	LR	2.9
208 Vac/1Ph/60Hz	FL	0.36
	LR	0.72
230 Vac/1Ph/60Hz	FL	0.32
	LR	0.68

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION

OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL

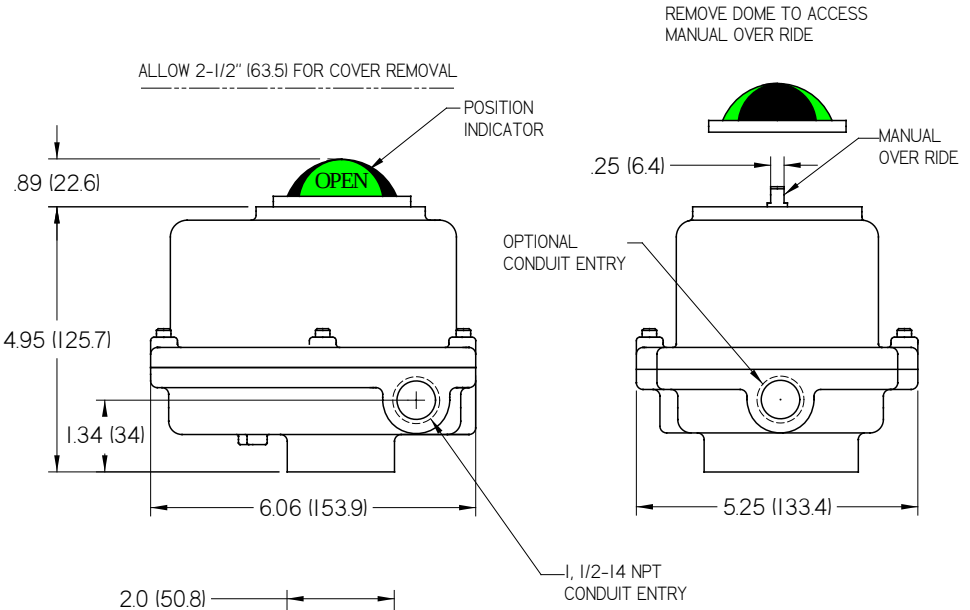
RXP

(100 IN-LB) NEMA 7

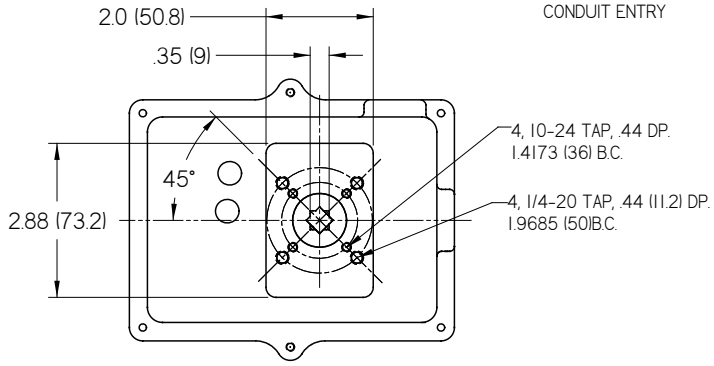
The R series compact electric rotary actuator was specifically designed for small ball valve and damper applications. This heavy-duty reversing actuator develops 100 In-lbs of torque and rotates from 0° to 90° in 2.5 seconds. The spur gear drive train has been designed for severe applications and can withstand stall conditions without suffering gear failure. The Industrial grade aluminum enclosure meets NEMA 7 specifications and has a thermally bonded ultraviolet-resistant polyester powder coating that not only enhances its appearance but also offers a high degree of corrosion resistance which protects against chemicals and solvents.

SPECIFICATIONS	
TORQUE	100 In-Lb (11.30 Nm)
CYCLE TIME	2.5 sec. / 90° 115 Vac & 230 Vac
DUTY CYCLE	25% (standard) 115 Vac
ENCLOSURE	NEMA 7, C, US certified by CSA
COATING	Thermally bonded polyester powder
POSITION IND.	Visual indicator Wired for light indication
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac
LUBRICATION	Permanent
WEIGHT	7 Lbs
INSTALLATION	Universal
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below
OVERRIDE	Manual, Non declutching Not available on DC voltage

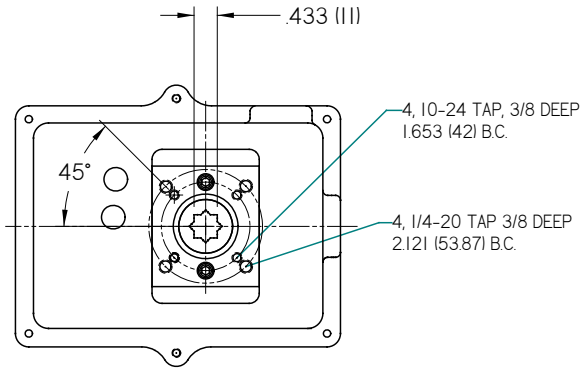
TECHNICAL DRAWINGS & WIRING DIAGRAM



MOUNTING PAD
ISO 5211 F03 Star drive
ISO 5211 F04 Star drive
ISO 5211 F03/04 Star drive



ISO 5211 F03

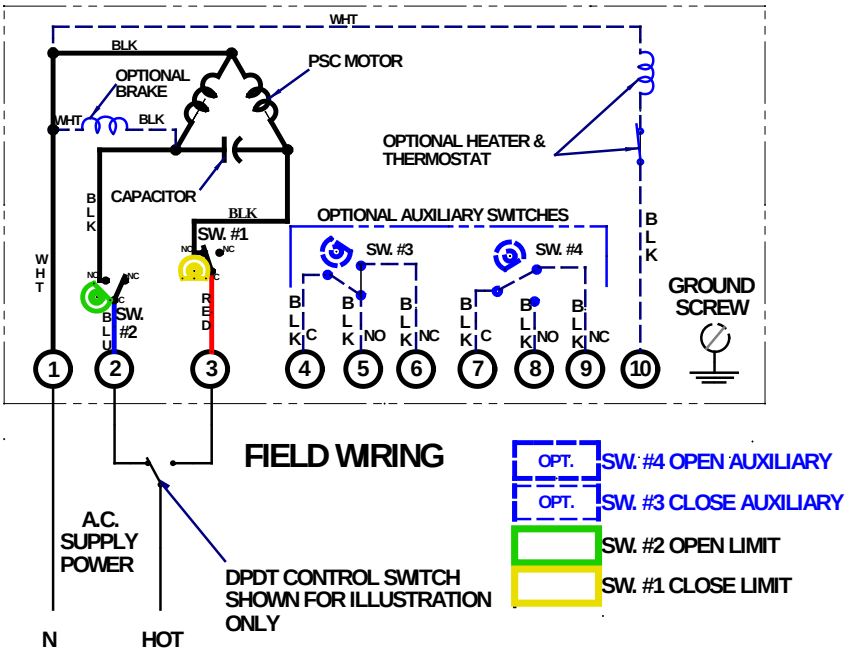


ISO 5211 F04

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	0.64
	LR	1.5
24 Vac	FL	0.4
	LR	2.4
24 Vdc	FL	0.4
	LR	2.4
12 Vdc	FL	0.6
	LR	2.9
208 Vac/1Ph/60Hz	FL	0.36
	LR	0.72
230 Vac/1Ph/60Hz	FL	0.32
	LR	0.68

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION

OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL
SD & SDX

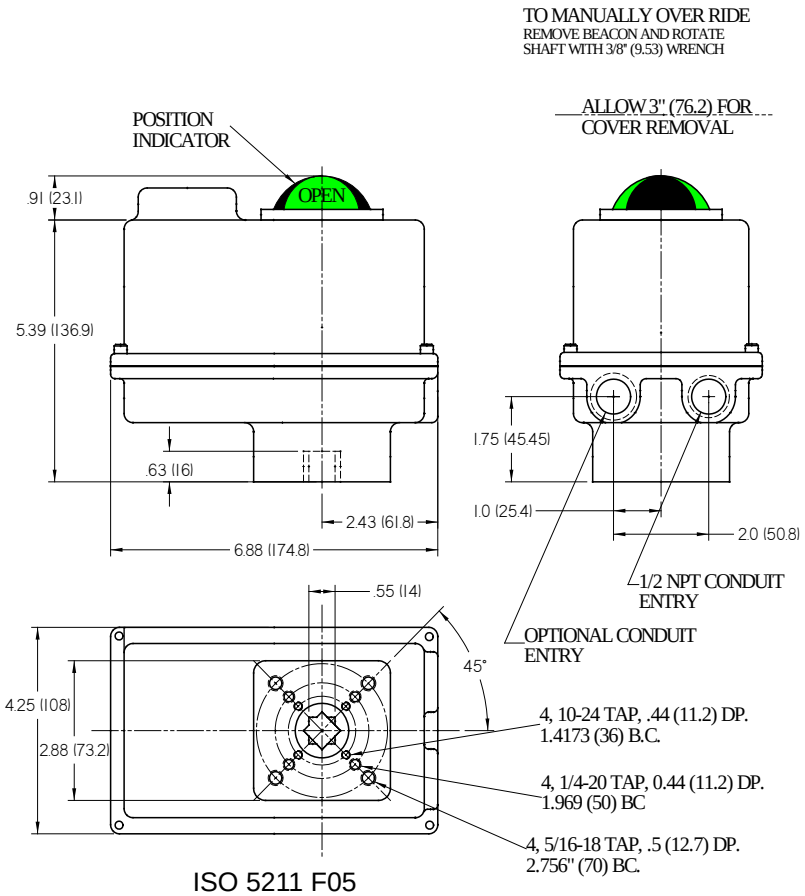
(200 to 300 IN-LB) NEMA 4

The S series model's SD & SDX are specifically designed for valve sizes from 3/4" to 2 1/2" and dampers that do not exceed the rated torque of the actuator. These compact yet robust quarter-turn electric actuators rotate from 0° to 90° in 5 seconds. Standard equipment includes 115 Vac / 1Ph motor with thermal overload protection, two limit switches wired for light indication, stainless steel fasteners, captured cover screws and 300 series stainless steel output drive, spring friction brake, non-declutching manual override and position indicator.

SPECIFICATIONS

TORQUE	200 In-Lb (22.6 Nm) 300 In-Lb (33.9 Nm)
CYCLE TIME	5 sec. / 90° 115 Vac & 230 Vac 10 sec. / 90° with 75% duty cycle
DUTY CYCLE	25% (standard) 115 Vac & 230 Vac 75% (optional) 12 Vdc & 24 Vdc / Vac
ENCLOSURE	NEMA 4 standard
COATING	Thermally bonded polyester powder
POSITION IND.	Visual indicator Wired for light indication
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac
LUBRICATION	Permanent
WEIGHT	10 Lbs
INSTALLATION	Universal
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below
OVERRIDE	Manual, Non declutching Declutching manual override optional DC voltage & 75% duty cycle must be declutching

TECHNICAL DRAWINGS & WIRING DIAGRAM



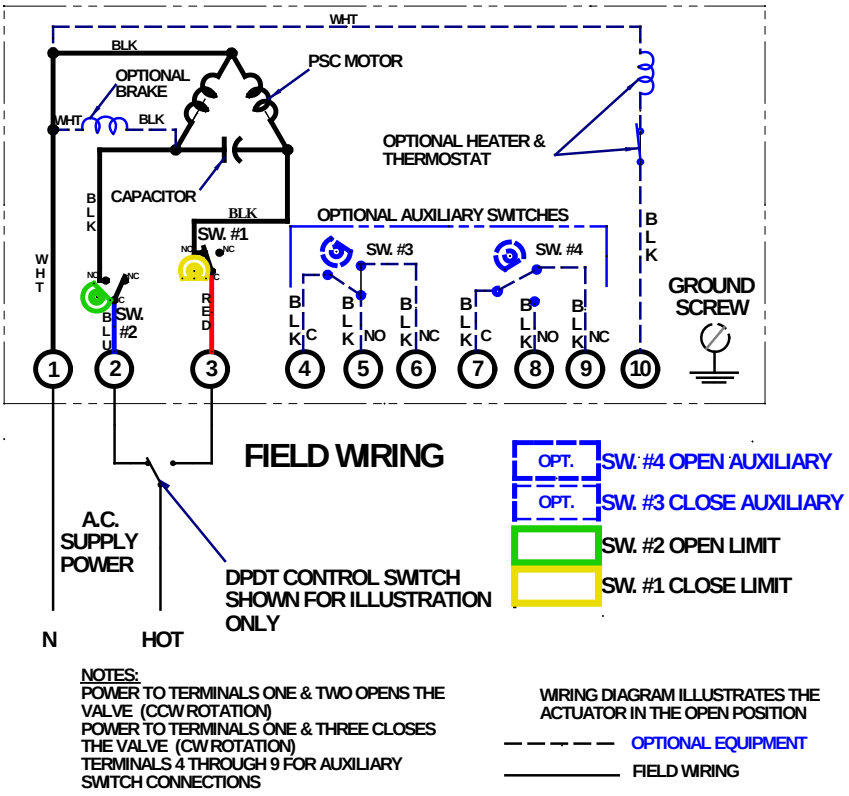
ISO 5211 F05

MOUNTING PAD
ISO 5211 F03 Star drive
using Insert #16006
ISO 5211 F05 Star drive
ISO 5211 F07, F05 Star drive

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	0.38
	LR	0.75
115 Vac Ext'ed Duty	FL	0.38
	LR	0.75
24 Vac	FL	0.7
	LR	3.2
24 Vdc	FL	0.7
	LR	3.2
12 Vdc	FL	1.3
	LR	4.2
208 Vac/1Ph/60Hz	FL	0.21
	LR	0.42
230 Vac/1Ph/60Hz	FL	0.18
	LR	0.38

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION
OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL
SR & SX

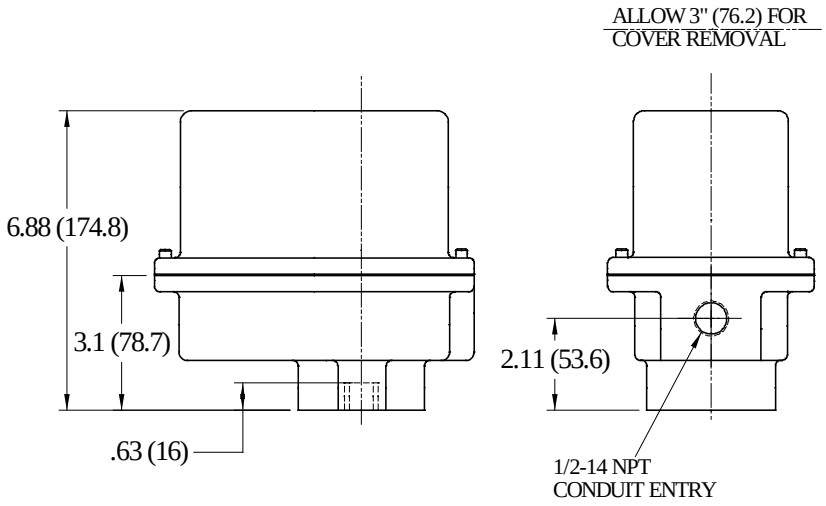
(200 & 300 IN-LB) NEMA 4 DEEP BASE

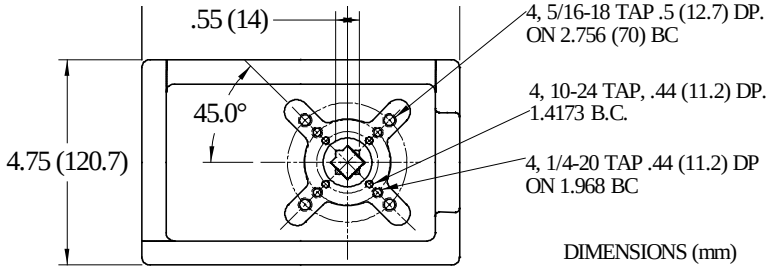
The S series deep base rotary electric actuator was designed exclusively for applications within the SR & SX torque range with various control requirements. This heavy-duty reversing actuator is used when optional equipment such as 4-20mA control, timers, and speed control are required. These compact actuators are equipped with spur gear drive and as in all ICI actuators can withstand stall conditions without suffering gear failure.

SPECIFICATIONS

TORQUE	200 In-Lb (22.6 Nm) 300 In-Lb (33.9 Nm)
CYCLE TIME	5 sec. / 90° 115 Vac & 230 Vac 10 sec. / 90° with 75% duty cycle 9.0 sec. / 90° 12 Vdc & 24 Vdc / Vac
DUTY CYCLE	25% (standard) 115 Vac & 230 Vac 75% (optional) 12 Vdc & 24 Vdc / Vac
ENCLOSURE	NEMA 4 standard
COATING	Thermally bonded polyester powder
POSITION IND.	Visual indicator (optional) Wired for light indication
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac
LUBRICATION	Permanent
WEIGHT	14 Lbs
INSTALLATION	Universal
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below
OVERRIDE	Manual, not declutching (optional) Declutching manual override (optional)

TECHNICAL DRAWINGS & WIRING DIAGRAM





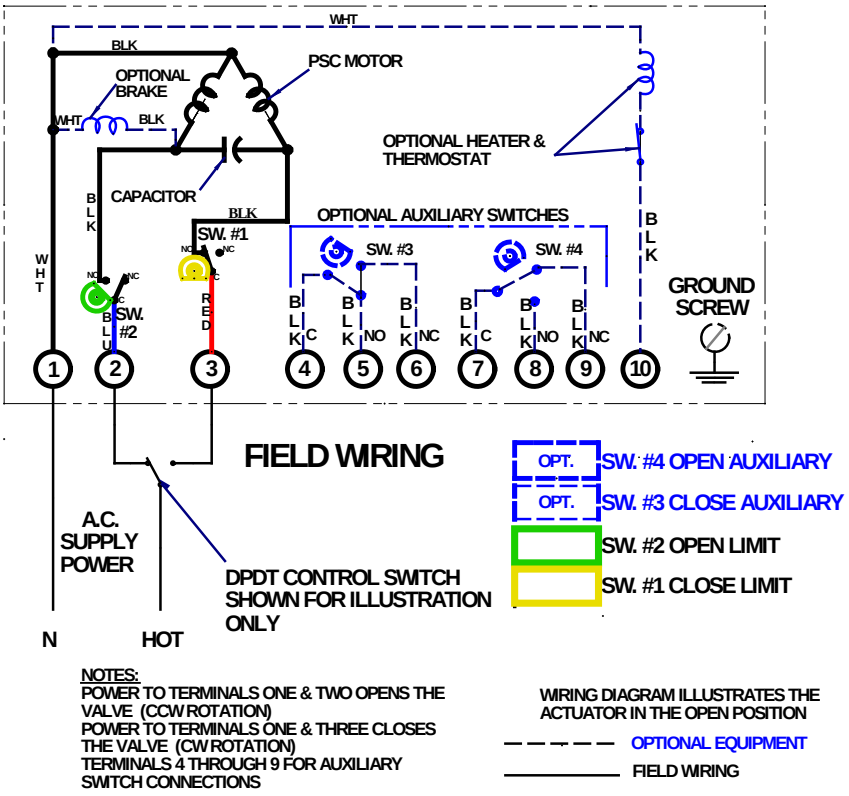
ISO 5211 F05

MOUNTING PAD
ISO 5211 F03 Star drive
using Insert #16006
ISO 5211 F05 Star drive
ISO 5211 F07, F05 Star drive

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	0.38
	LR	0.75
115 Vac Ext'ed Duty	FL	0.38
	LR	0.75
24 Vac	FL	0.7
	LR	3.2
24 Vdc	FL	0.7
	LR	3.2
12 Vdc	FL	1.3
	LR	4.2
208 Vac/1Ph/60Hz	FL	0.21
	LR	0.42
230 Vac/1Ph/60Hz	FL	0.18
	LR	0.38

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION

OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL

SR & SX

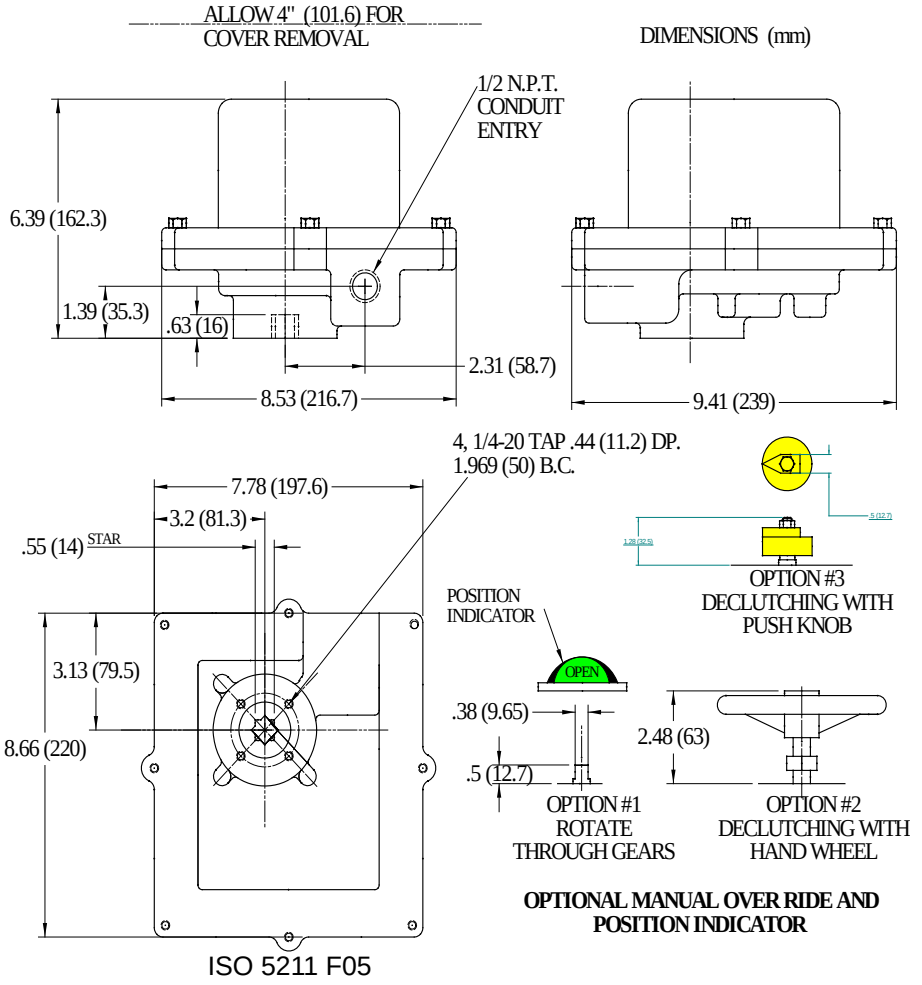
(200 & 300 IN-LB) NEMA 7

The S series NEMA 7 rotary electric actuator was designed solely for applications within the SR & SX torque range used in hazardous locations. These heavy-duty reversing actuators are used in place of model SD, SR, SDX, and SX when the area used in requires enclosure rating of Class I Groups C & D or Class II Groups E, F, & G div. I and II. These compact actuators are equipped with spur gear drive and, as in all ICI actuators, can withstand all conditions without suffering gear failure.

SPECIFICATIONS

TORQUE	200 In-Lb (22.6 Nm) 300 In-Lb (33.9 Nm)
CYCLE TIME	5 sec. / 90° 115 Vac & 230 Vac 10 sec. / 90° with 75% duty cycle 9.0 sec. / 90° 12 Vdc & 24 Vdc / Vac
DUTY CYCLE	25% (standard) 115 Vac & 230 Vac 75% (optional) 12 Vdc & 24 Vdc / Vac
ENCLOSURE	NEMA 7, C, US certified by CSA
COATING	Thermally bonded polyester powder
POSITION IND.	Visual indicator (optional) Wired for light indication
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac
LUBRICATION	Permanent
WEIGHT	14 Lbs
INSTALLATION	Universal
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below
OVERRIDE	Manual, not declutching (optional) Declutching manual override (optional)

TECHNICAL DRAWINGS & WIRING DIAGRAM



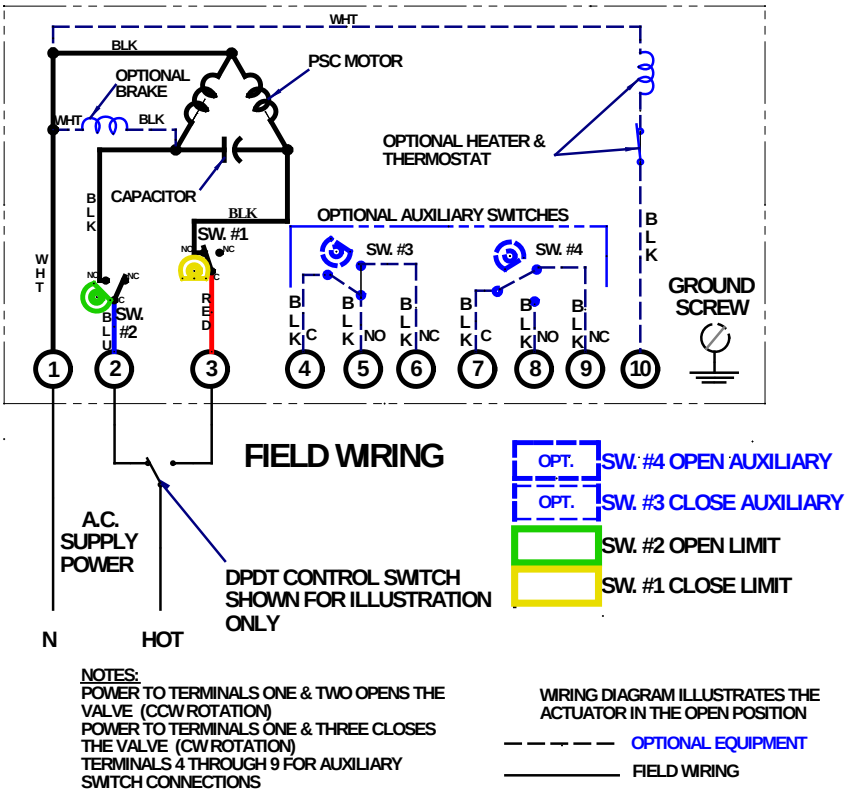
ISO 5211 F05

MOUNTING PAD
ISO 5211 F03 Star drive
using Insert #16006
ISO 5211 F05 Star drive
ISO 5211 F07, F05 Star drive

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	0.38
	LR	0.75
115 Vac Ext'ed Duty	FL	0.38
	LR	0.75
24 Vac	FL	0.7
	LR	3.2
24 Vdc	FL	0.7
	LR	3.2
12 Vdc	FL	1.3
	LR	4.2
208 Vac/1Ph/60Hz	FL	0.21
	LR	0.42
230 Vac/1Ph/60Hz	FL	0.18
	LR	0.38

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION
OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL
M SERIES

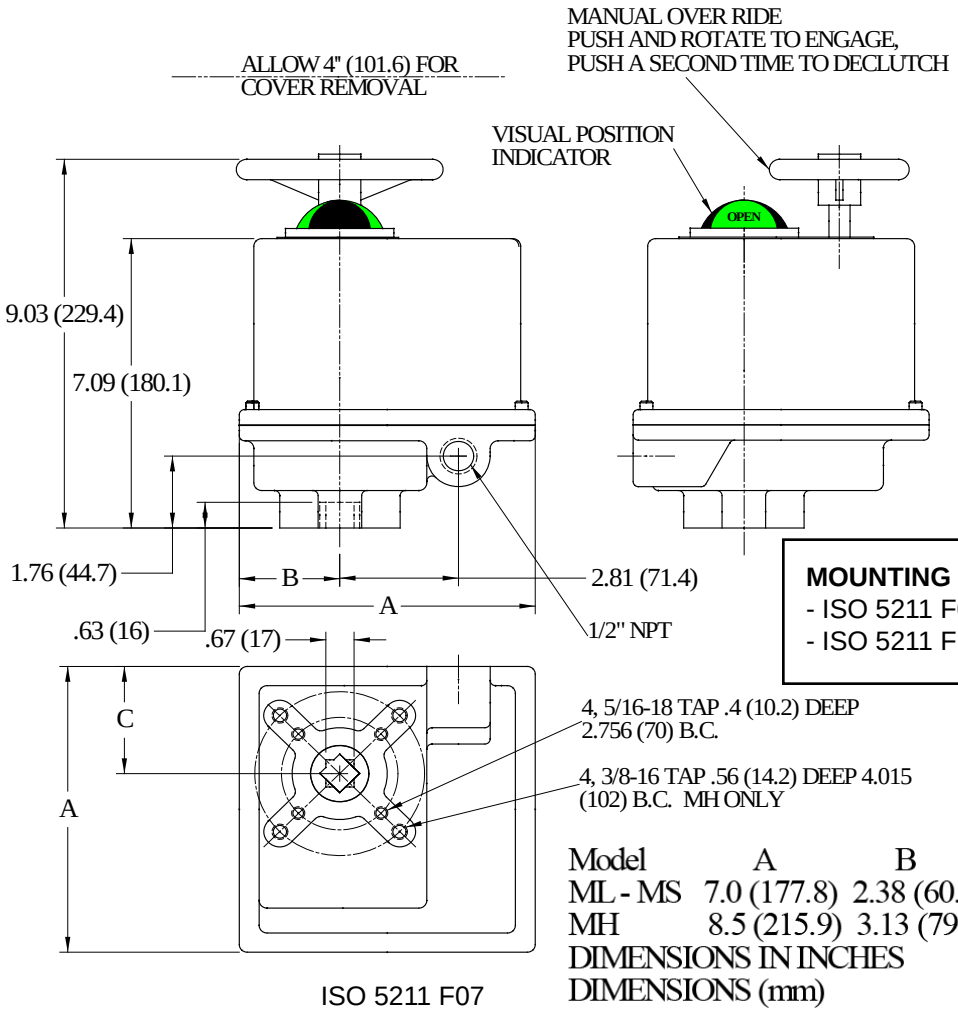
(400, 675, 1,000 & 1,500 IN-LB) NEMA 4

ICI's M series rotary electric actuator was designed for quarter turn valve and damper applications requiring up to 1,500 lb-in torque. This industrial grade reversing actuator has been manufactured for over twenty-five years and has achieved an impeccable reputation for reliablity in applications requiring repeated superior performance year after year. This machine has a hardened steel spur gear drive train guaranteeing high efficiency, quiet operation and long trouble free life.

SPECIFICATIONS

TORQUE	MS	400 In-Lb	(45.2 Nm)
	MR	675 In-Lb	(76.3 Nm)
	ML	1,000 In-Lb	(113 Nm)
	MH	1,500 In-Lb	(169 Nm)
CYCLE TIME	MS		10 sec. / 90° 115 Vac, 230 Vac & 12 Vdc
			20 sec. / 90° 75% duty, 24 Vdc & 24 Vac
	MR & ML		15 sec. / 90° 115 Vac, 230 Vac & 12 Vac
			30 sec. / 90° 75% duty, 24 Vdc & 24 Vac
	MH		30 sec. / 90° 115 Vac, 230 Vac & 12 Vdc
			70 sec. / 90° 75% duty, 24 Vdc & 24 Vac
DUTY CYCLE	25% (standard)	115 Vac & 230 Vac	
	75% (optional)	12 Vdc, 24 Vdc & 24 Vac	
ENCLOSURE	NEMA 4 (standard), CSA and C, US certified		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator		
	Wired for light indication		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	MS, MR, ML	16 Lbs	
	MH	21 Lbs	
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F		
	Heater & Thermostat required 0°F & below		
OVERRIDE	Manual, declutching		

TECHNICAL DRAWINGS & WIRING DIAGRAM



MOUNTING PAD
- ISO 5211 F07 Bolt Circle & Star Drive
- ISO 5211 F10 Bolt Circle (MH only)

Model	A	B	C
ML - MS	7.0 (177.8)	2.38 (60.5)	2.63 (66.8)
MH	8.5 (215.9)	3.13 (79.5)	3.38 (85.9)

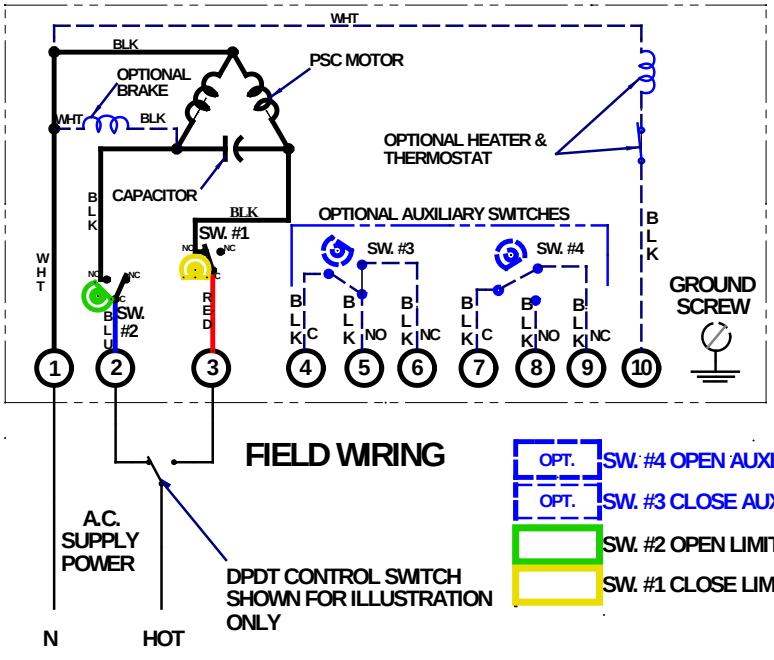
DIMENSIONS IN INCHES
DIMENSIONS (mm)

ISO 5211 F07

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

		MR	MS	ML & MH
115 Vac (Std.)	FL	0.38	0.38	0.38
	LR	0.75	0.75	0.75
115 Vac Ext'ed Duty	FL	0.38	0.38	0.38
	LR	0.75	0.75	0.75
24 Vac	FL	0.7	0.9	1.1
	LR	3.2	3.2	3.2
24 Vdc	FL	0.7	0.9	1.1
	LR	3.2	3.2	3.2
12 Vdc	FL	1.3	1.7	2.2
	LR	4.2	4.2	4.2
208 Vac/1Ph/60Hz	FL	0.21	0.21	0.21
	LR	0.42	0.42	0.42
230 Vac/1Ph/60Hz	FL	0.18	0.18	0.18
	LR	0.38	0.38	0.38

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION
OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL
M SERIES

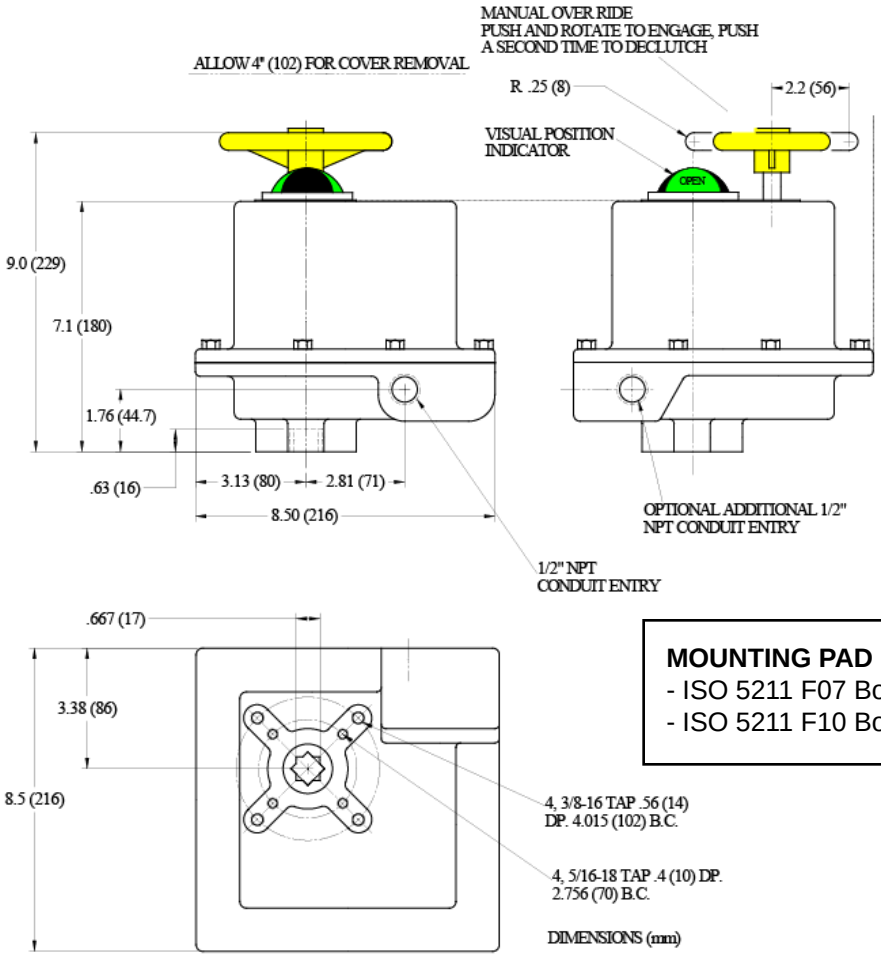
(400, 675, 1000 & 1,500 IN-LB) NEMA 7

ICI's M series rotary electric actuator was designed for quarter turn valve and damper applications requiring up to 1,500 lb-in torque. This industrial grade reversing actuator has been manufactured for over twenty-five years and has achieved an impeccable reputation for reliablity in applications requiring repeated superior performance year after year. This machine has a hardened steel spur gear drive train guaranteeing high efficiency, quiet operation and long trouble free life.

SPECIFICATIONS

TORQUE	MS	400 In-Lb	(45.2 Nm)
	MR	675 In-Lb	(76.3 Nm)
	ML	1,000 In-Lb	(113 Nm)
	MH	1,500 In-Lb	(169 Nm)
CYCLE TIME	MS		10 sec. / 90° 115 Vac, 230 Vac & 12 Vdc
			20 sec. / 90° 75% duty, 24 Vdc & 24 Vac
	MR & ML		15 sec. / 90° 115 Vac, 230 Vac & 12 Vac
			30 sec. / 90° 75% duty, 24 Vdc & 24 Vac
	MH		30 sec. / 90° 115 Vac, 230 Vac & 12 Vdc
			70 sec. / 90° 75% duty, 24 Vdc & 24 Vac
DUTY CYCLE	25% (standard)	115 Vac & 230 Vac	
	75% (optional)	12 Vdc, 24 Vdc & 24 Vac	
ENCLOSURE	NEMA 7, C, US certified by CSA		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator		
	Wired for light indication		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	MS, MR, ML	21 Lbs	
	MH	22 Lbs	
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F		
	Heater & Thermostat required 0°F & below		
OVERRIDE	Manual, declutching		

TECHNICAL DRAWINGS & WIRING DIAGRAM



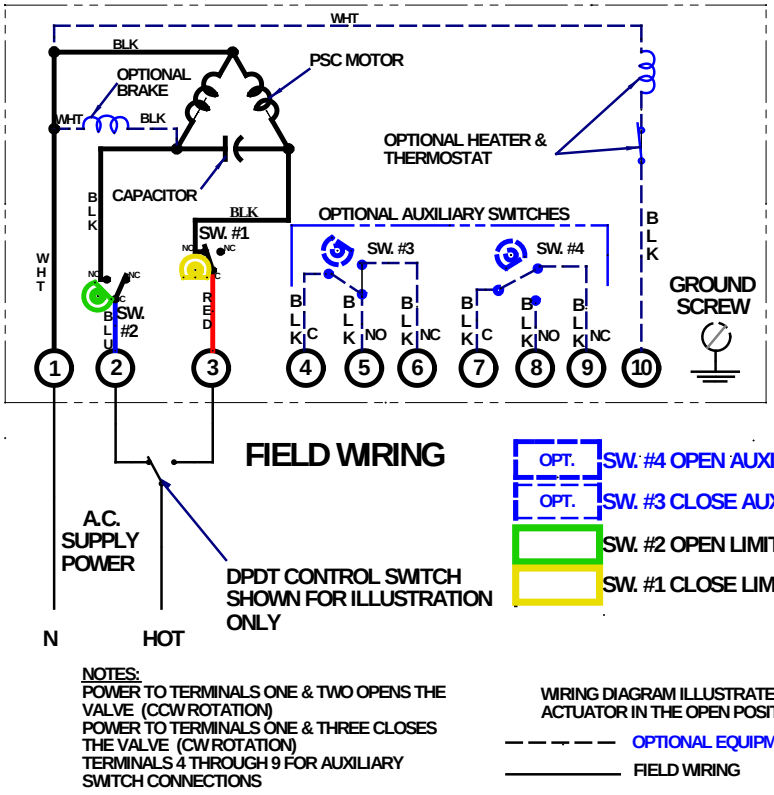
ISO 5211 F07

MOUNTING PAD
- ISO 5211 F07 Bolt Circle & Star Drive
- ISO 5211 F10 Bolt Circle

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

		MR	MS	ML & MH
115 Vac (Std.)	FL	0.38	0.38	0.38
	LR	0.75	0.75	0.75
115 Vac Ext'ed Duty	FL	0.38	0.38	0.38
	LR	0.75	0.75	0.75
24 Vac	FL	0.7	0.9	1.1
	LR	3.2	3.2	3.2
24 Vdc	FL	0.7	0.9	1.1
	LR	3.2	3.2	3.2
12 Vdc	FL	1.3	1.7	2.2
	LR	4.2	4.2	4.2
208 Vac/1Ph/60Hz	FL	0.21	0.21	0.21
	LR	0.42	0.42	0.42
230 Vac/1Ph/60Hz	FL	0.18	0.18	0.18
	LR	0.38	0.38	0.38

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION
OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL
L SERIES

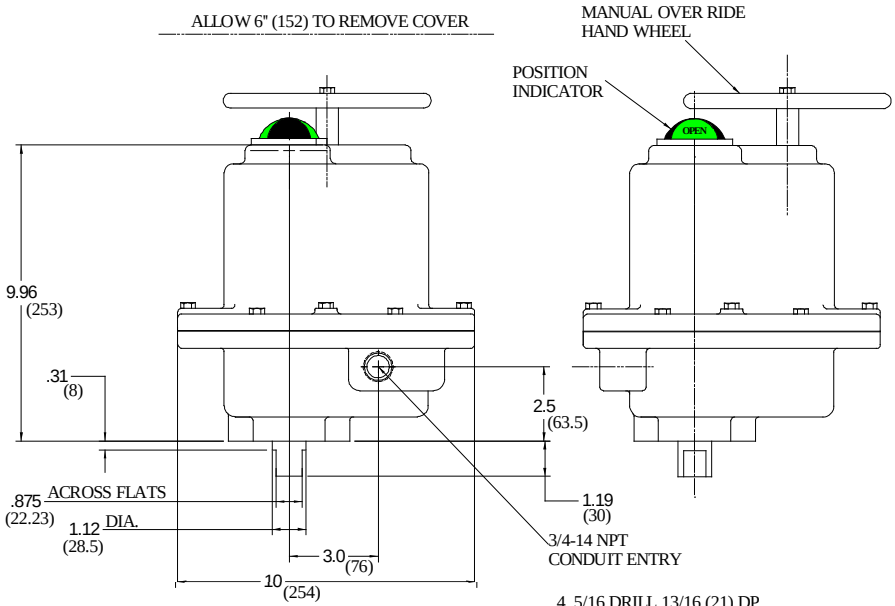
(700 to 3,840 IN-LB) NEMA 4 & 7

ICI's L series rotary electric actuator was designed for quarter turn valve and damper applications requiring up to 3,840 in-lbs of torque. This industrial grade reversing actuator has been manufactured since 1991 and is well known for its dependability in harsh applications where reliablity is of the utmost importance. The L series actuators are equipped with hardened steel spur gears guaranteeing high effiency, quiet operation, a long trouble free life, and as all ICI actuators can withstand stall conditions without suffering gear failure.

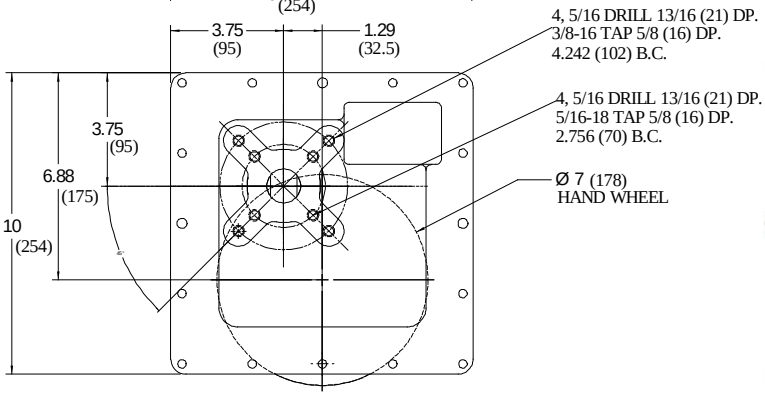
SPECIFICATIONS

TORQUE	LA-5	700 In-Lb	(79 Nm)
	LA-12	2,000 In-Lb	(226 Nm)
	LX-5	1,200 In-Lb	(135 Nm)
	LX-14	3,840 In-Lb	(434 Nm)
CYCLE TIME	LA-5	5 sec. / 90°	
	LA-12	12 sec. / 90°	
	LX-5	5 sec. / 90°	
	LX-14	14 sec. / 90°	
DUTY CYCLE	Continuous		
ENCLOSURE	NEMA 4 (standard), C, US certified by CSA NEMA 7 (optional), C, US certified by CSA		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator Wired for light indication		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	40 Lbs		
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below		
OVERRIDE	Manual, declutching		

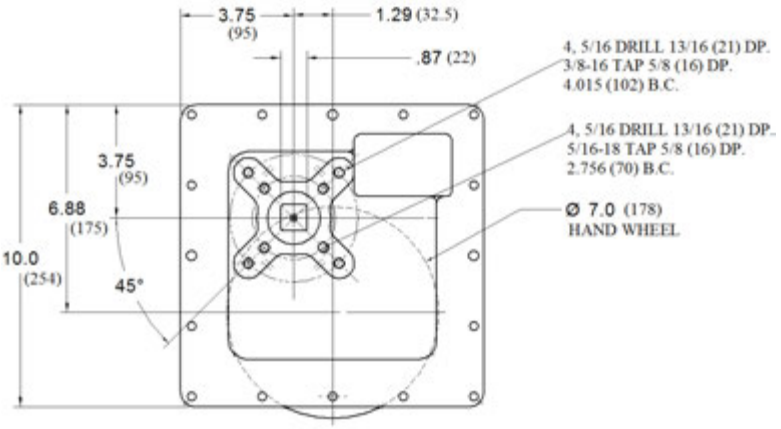
TECHNICAL DRAWINGS & WIRING DIAGRAM



MOUNTING PAD
ISO 5211 F07 BC Male drive
ISO 5211 F10 BC, 22 mm SQ Female drive (optional)



ISO 5211 F07

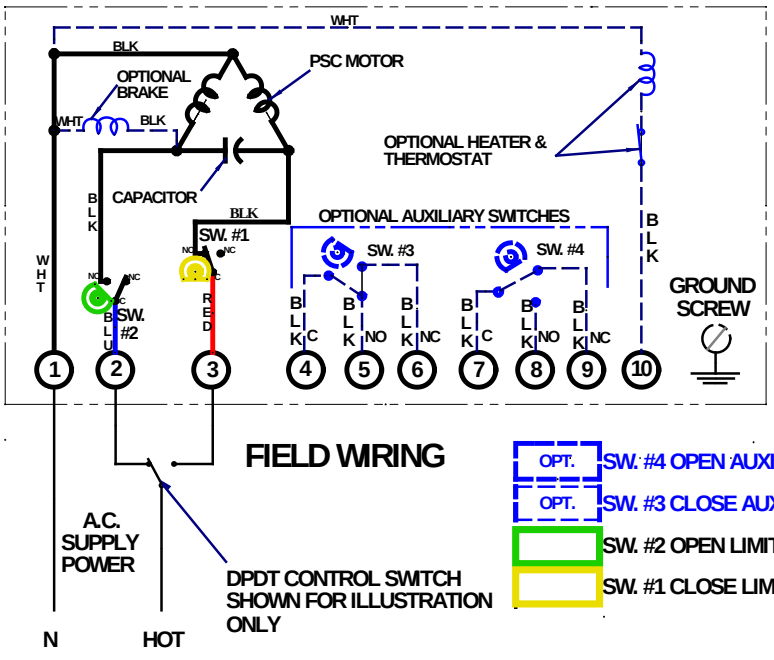


ISO 5211 F10

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

		LA	LX
115 Vac (Std.)	FL	1.6	1.6
	LR	2.9	2.9
24 Vac	FL	3.7	5
	LR	25	25
24 Vdc	FL	3.7	5
	LR	25	25
12 Vdc	FL	6.9	10
	LR	48	48
208 Vac/1Ph/60Hz	FL	1.2	1.2
	LR	2.2	2.2
230 Vac/1Ph/60Hz	FL	1.03	1.03
	LR	2	2

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 THROUGH 9 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION
OPTIONAL EQUIPMENT
FIELD WIRING

INDELAC MODEL

5, 7, 12 & 14 K

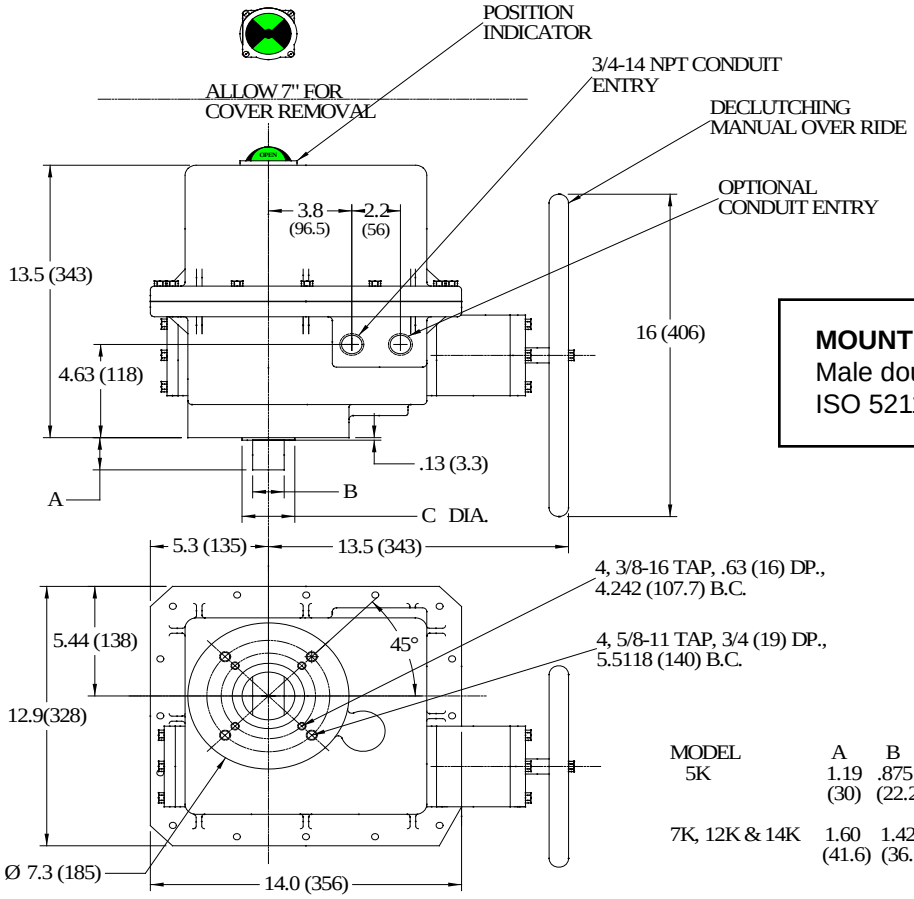
(5,000, 7,020, 11,500 & 14,040 IN-LB) NEMA 4 & 7

This series of heavy-duty reversing actuators were developed in 1995 and went into production early in 1996. ICI's K series rotary electric actuator is a machine that was designed to automate quarter turn equipment requiring up to 14,040 In-Lbs of torque. K series actuators are equipped with a combination of spur gear / worm gear drive train providing efficient and quiet operation, resistance to back driving and long maintenance free service.

SPECIFICATIONS

TORQUE	5K	5,000 In-Lb	(565 Nm)
	7K	7,020 In-Lb	(793 Nm)
	12K	11,520 In-Lb	(1,302 Nm)
	14K	14,040 In-Lb	(1,586 Nm)
CYCLE TIME	5K & 7K	38 sec. / 90°	
	12K	43 sec. / 90°	
	14K	68 sec. / 90°	
DUTY CYCLE	30 Min		
ENCLOSURE	NEMA 4 (standard) NEMA 4x, 7, and 4/7 (optional)		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator Wired for light indication		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	110 Lbs		
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below		
OVERRIDE	Manual, declutching		

TECHNICAL DRAWINGS & WIRING DIAGRAM



MOUNTING PAD
Male double "D" shaft, 4.242" BC
ISO 5211 F14, 5.512" BC

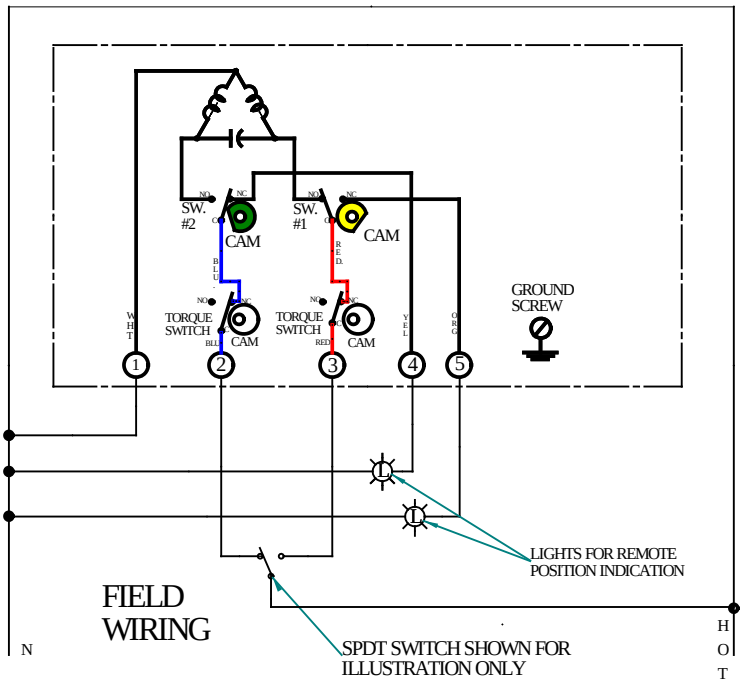
MODEL	A	B	C
5K	1.19 (30)	.875 (22.2)	1.13 (28)
7K, 12K & 14K	1.60 (41.6)	1.42 (36.1)	2.38 (60.5)

ISO 5211 F14

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

		5K	7K	12K	14K
115 Vac (Std.)	FL	1.6	1.6	2.8	2.8
	LR	2.9	2.9	7.1	7.1
24 Vac	FL	5	5	3.7	14
	LR	25	25	25	-
24 Vdc	FL	5	5	3.7	14
	LR	25	25	25	-
12 Vdc	FL	10	10	6.9	-
	LR	48	48	48	-
208 Vac/1Ph/60Hz	FL	1.2	1.2	1.2	1.2
	LR	2.2	2.2	2.2	2.2
230 Vac/1Ph/60Hz	FL	1.03	1.03	1.03	1.03
	LR	2	2	2	2
230 Vac/3Ph	FL	1.26	1.26	1.26	1.26
	LR	4.3	4.3	4.3	4.3
460 Vac/3Ph	FL	0.5	0.5	0.5	0.5
	LR	1.9	1.9	1.9	1.9

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 & 5 FOR LIGHT INDICATION
TERMINALS 6 THROUGH 11 FOR AUXILIARY SWITCHES & TERMINAL 12 FOR HEATER & THERMOSTAL.

SW. #2 OPEN LIMIT
SW. #1 CLOSE LIMIT

WIRING DIAGRAM DEPICTS THE ACTUATOR IN THE OPEN POSITION

INDELAC MODEL

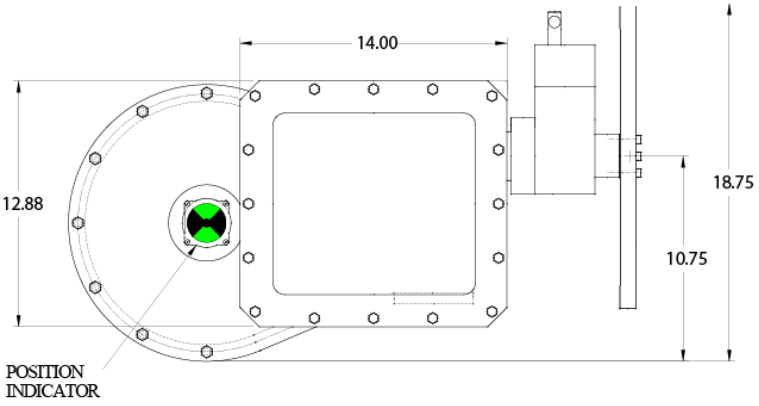
19 K

(19,020 IN-LB) NEMA 4 & 7

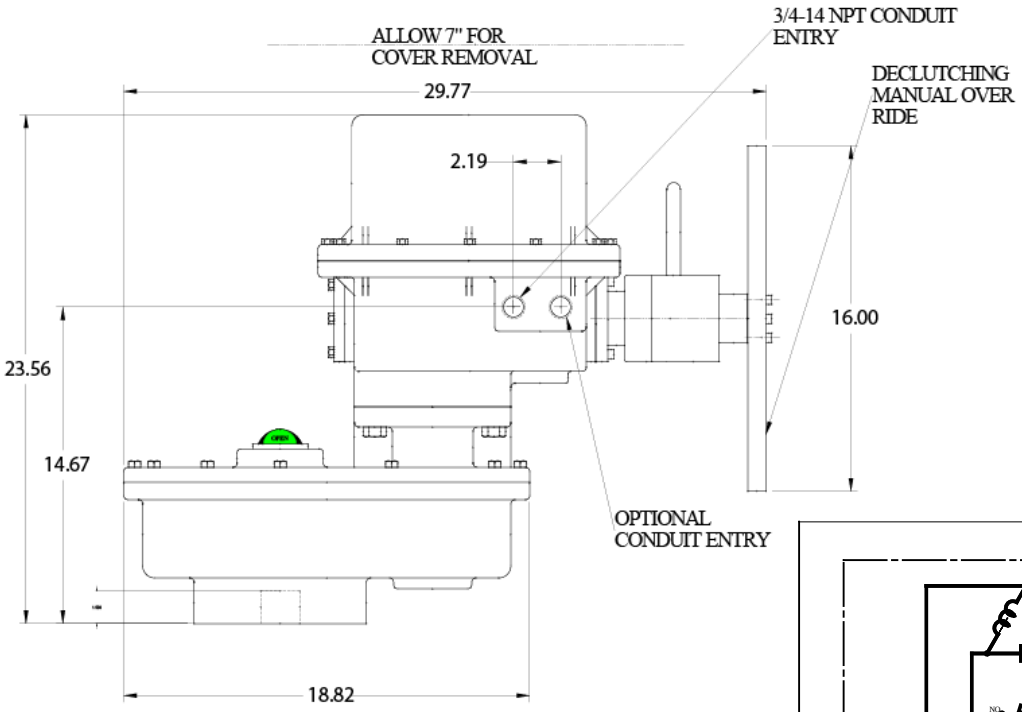
This series of heavy-duty reversing actuators were developed in 2009 and went into production early in 1996. ICI's K series rotary electric actuator is a machine that was designed to automate quarter turn equipment requiring up to 19,020 In-Lbs of torque. K series actuators are equipped with a combination of spur gear / worm gear drive train providing efficient and quiet operation, resistance to back driving and long maintenance free service.

SPECIFICATIONS	
TORQUE	19,020 In-Lb (2,148.97 Nm)
CYCLE TIME	114 sec. / 90°
DUTY CYCLE	30 Min
ENCLOSURE	NEMA 4 (standard) NEMA 4x, 7, and 4/7 (optional)
COATING	Thermally bonded polyester powder
POSITION IND.	Visual indicator Wired for light indication
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac
LUBRICATION	Permanent
WEIGHT	195 Lbs
INSTALLATION	Universal
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below
OVERRIDE	Manual, declutching

TECHNICAL DRAWINGS & WIRING DIAGRAM



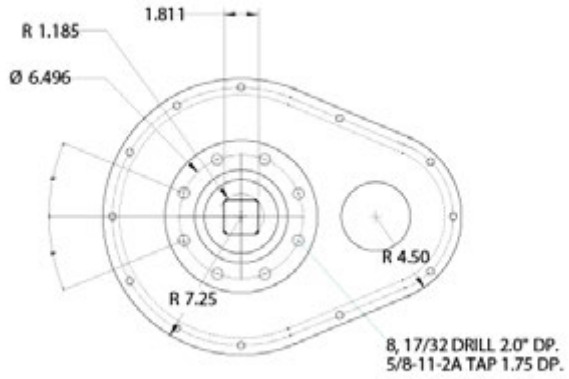
MOUNTING PAD
ISO 5211 F16 Square nail shaft



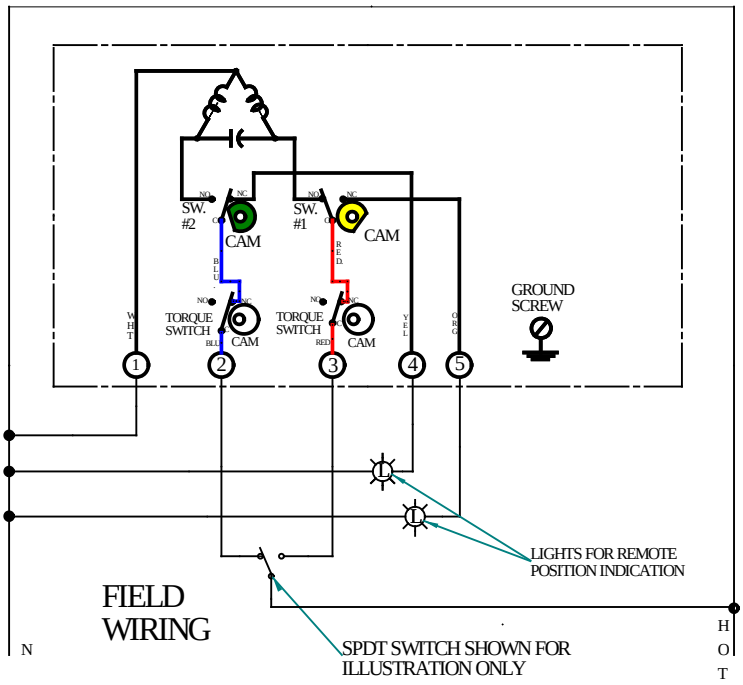
MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	2.8
	LR	7.1
208 Vac/1Ph/60Hz	FL	1.2
	LR	2.2
230 Vac/1Ph/60Hz	FL	1.2
	LR	4
230 Vac/3Ph	FL	0.95
	LR	4
460 Vac/3Ph	FL	0.5
	LR	2.16

FL = Full Load, LR = Lock Rotor



ISO 5211 F16



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 & 5 FOR LIGHT INDICATION
TERMINALS 6 THROUGH 11 FOR AUXILIARY SWITCHES & TERMINAL 12 FOR HEATER & THERMOSTAL.

SW. #2 OPEN LIMIT
SW. #1 CLOSE LIMIT

WIRING DIAGRAM DEPICTS THE ACTUATOR IN THE OPEN POSITION

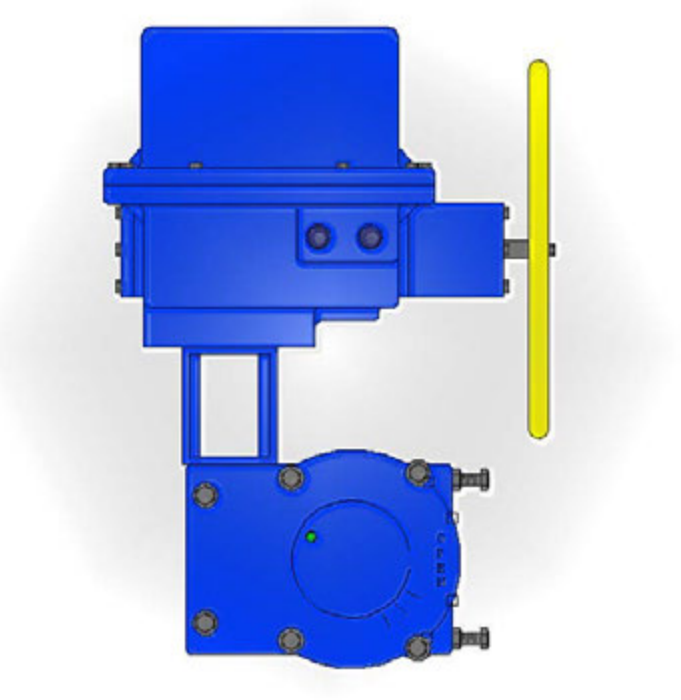
INDELAC MODEL

27 K

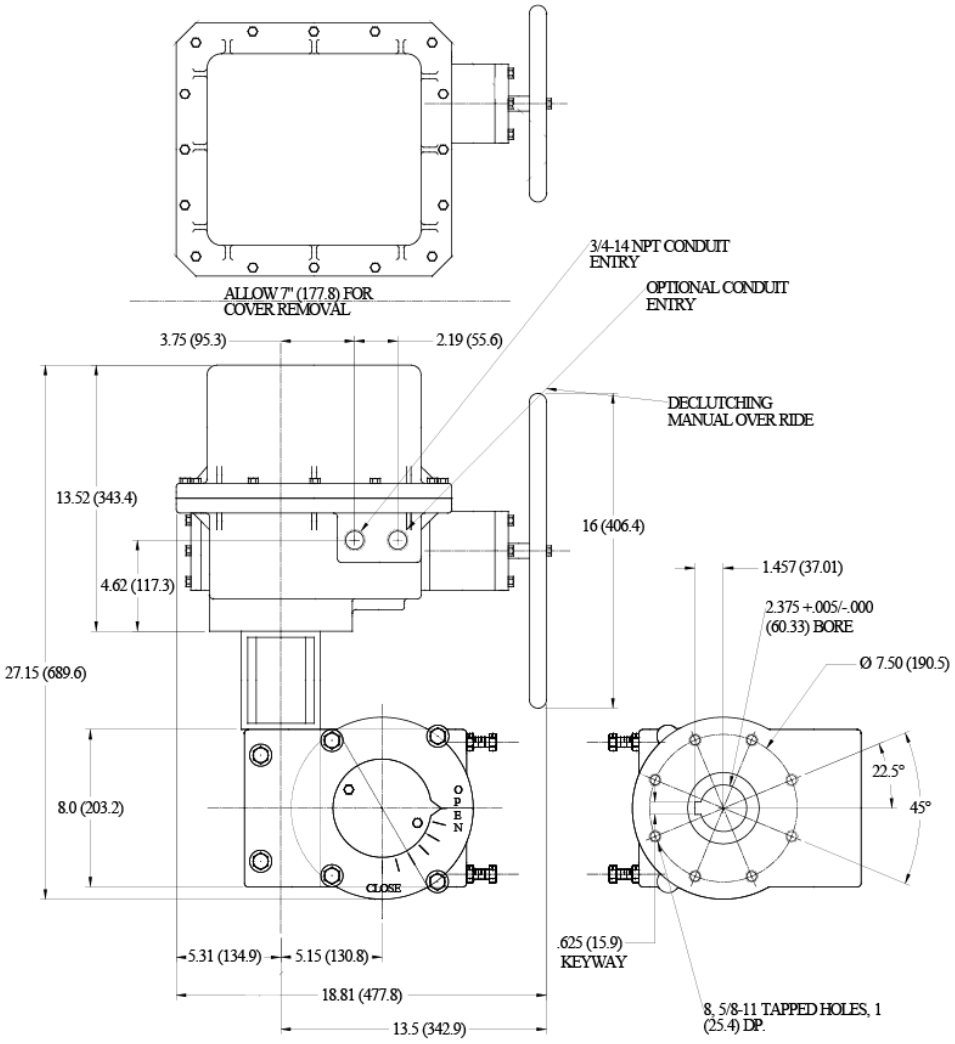
(27,300 IN-LB) NEMA 4 & 7

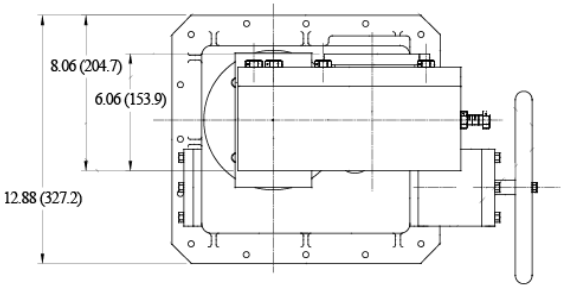
This series of heavy-duty reversing actuators were developed in 2007 and went into production early in 1996. ICI's K series rotary electric actuator is a machine that was designed to automate quarter turn equipment requiring up to 27,300 In-Lbs of torque. K series actuators are equipped with a combination of spur gear / worm gear drive train providing efficient and quiet operation, resistance to back driving and long maintenance free service.

SPECIFICATIONS		
TORQUE	27,300 In-Lb	(3,084 Nm)
CYCLE TIME	136 sec. / 90°	
DUTY CYCLE	30 Min	
ENCLOSURE	NEMA 4 (standard) NEMA 4x, 7, and 4/7 (optional)	
COATING	Thermally bonded polyester powder	
POSITION IND.	Visual indicator Wired for light indication	
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac	
LUBRICATION	Permanent	
WEIGHT	170 Lbs	
INSTALLATION	Universal	
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below	
OVERRIDE	Manual, declutching	



TECHNICAL DRAWINGS & WIRING DIAGRAM



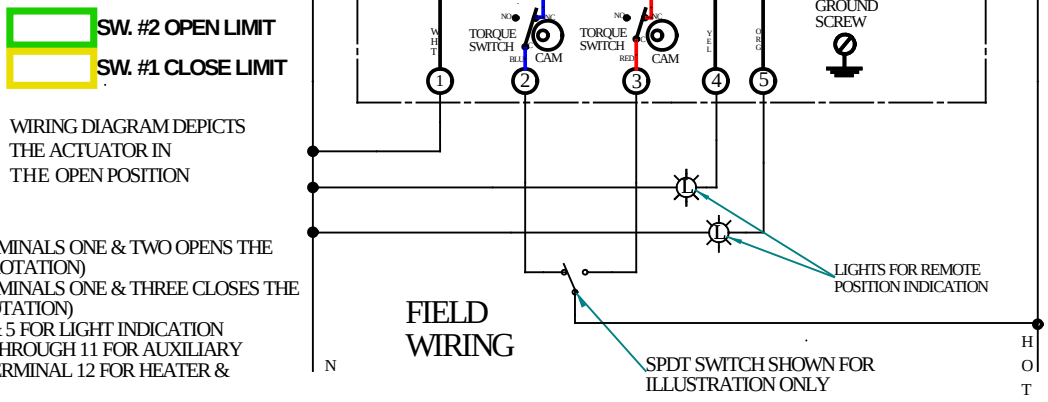


MOUNTING PAD
2.375 BORE - 0.625 KEYWAY, 7.5" BC

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	2.8
	LR	7.1
208 Vac/1Ph/60Hz	FL	1.2
	LR	2.2
230 Vac/1Ph/60Hz	FL	1.2
	LR	4
230 Vac/3Ph	FL	0.95
	LR	4
460 Vac/3Ph	FL	0.5
	LR	2.16

FL = Full Load, LR = Lock Rotor



SW. #2 OPEN LIMIT

SW. #1 CLOSE LIMIT

WIRING DIAGRAM DEPICTS THE ACTUATOR IN THE OPEN POSITION

NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 & 5 FOR LIGHT INDICATION
TERMINALS 6 THROUGH 11 FOR AUXILIARY SWITCHES & TERMINAL 12 FOR HEATER & THERMOSTAL.

INDELAC MODEL

SNS

SAFE & SECURE SERIES ACTUATOR WITH BATTERY BACKUP

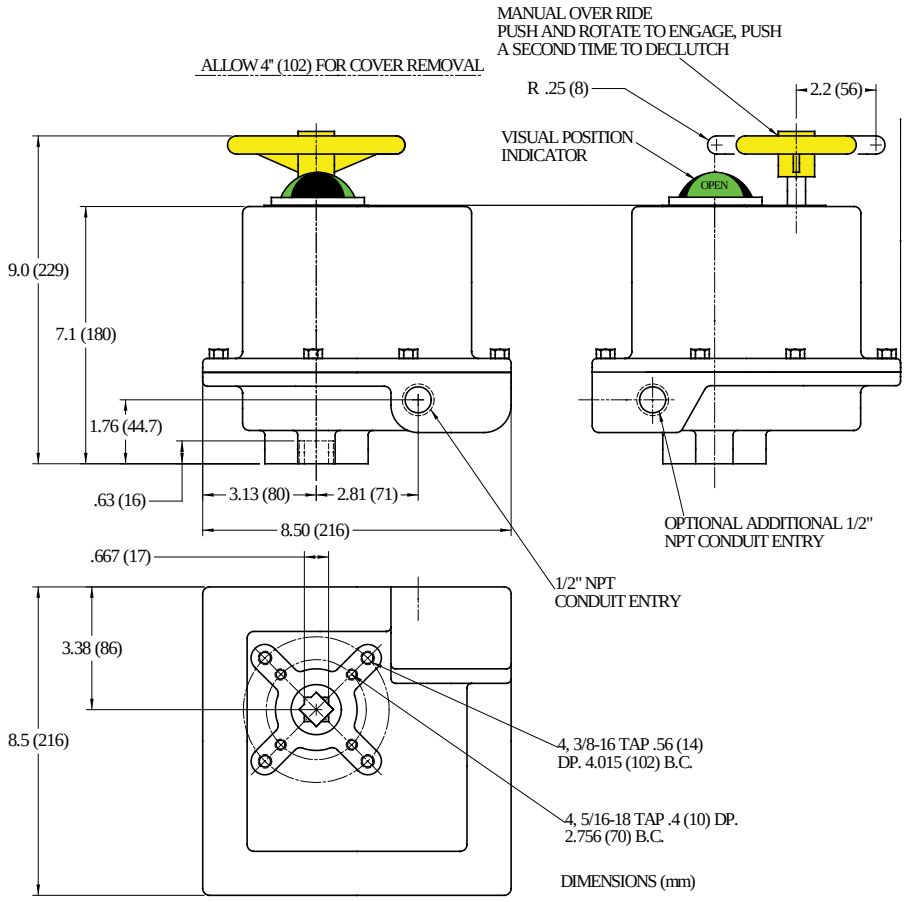
The Safe & Secure Series is a compact powerful solution for critical applications. With its own built in power supply the Safe & Secure series couples the reliability of our American made electric actuators with the added security of a fail-safe battery backup system. Equipped with an internal battery this unit is field adjustable to fail closed, fail open, or continue standard operations. The Safe & Secure series leaves you in control during sudden loss of utility power or control signal.

SPECIFICATIONS

TORQUE	SNS1	100 Lb-In	(11.3 Nm)
	SNS2	200 Lb-In	(22.6 Nm)
	SNS3	300 Lb-In	(33.9 Nm)
	SNS4	400 Lb-In	(45.19 Nm)
	SNS6	675 Lb-In	(76.26 Nm)
	SNS10	1,000 Lb-In	(112.98 Nm)
	SNS15	1,500 Lb-In	(169.48 Nm)
CYCLE TIME	SNS1	6 sec. / 90°	
	SNS2	6 sec. / 90°	
	SNS3	6 sec. / 90°	
	SNS4	10 sec. / 90°	
	SNS6	15 sec. / 90°	
	SNS10	20 sec. / 90°	
	SNS15	30 sec. / 90°	
DUTY CYCLE	75% (standard)		
ENCLOSURE	NEMA 4 (standard) NEMA 7 (optional)		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator Wired for light indication		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	18 Lbs		
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below		
OVERRIDE	Manual, declutching (optional)		

INDELAC CONTROLS, INC. FLORENCE, KY 41042 TOLL FREE: 1-800-662-9424 www.INDELAC.com

TECHNICAL DRAWINGS & WIRING DIAGRAM



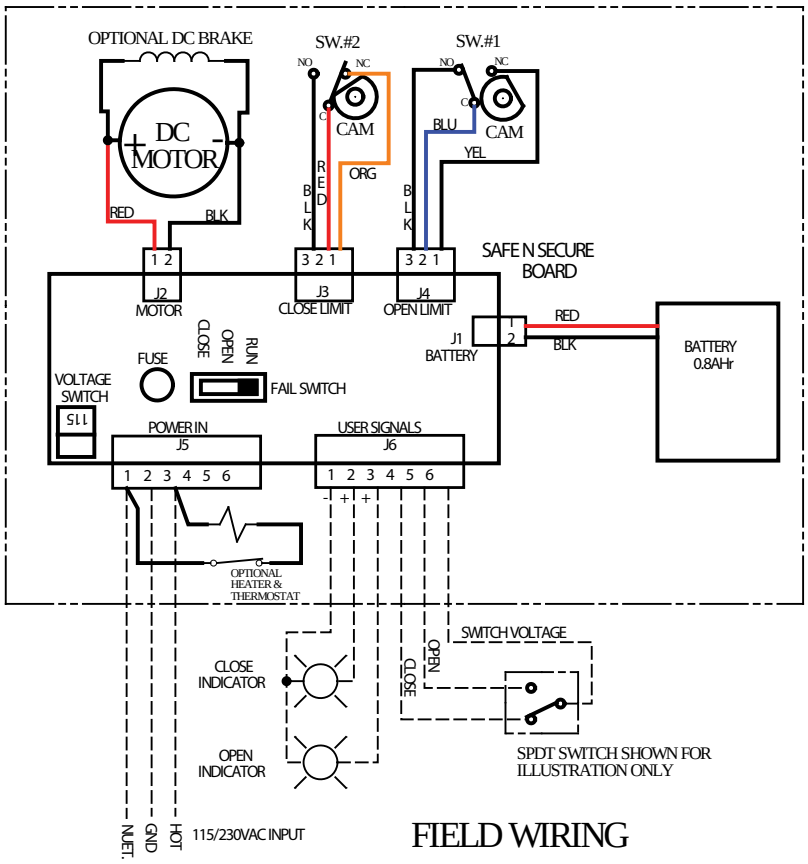
ISO 5211 F07

MOUNTING PAD
ISO 5211 F03 Star drive
ISO 5211 F04 Star drive
ISO 5211 F07 Star drive
ISO 5211 F10 Star drive

MOTOR SPECIFICATIONS
Brushless 12 Vdc (all voltages)
with thermal overload protection

	12 Vdc	
	FL	LR
SNS1	1.34	2.38
SNS2	1.34	2.38
SNS3	1.34	2.38
SNS4	1.65	2.38
SNS6	1.5	2.38
SNS10	2.2	2.38
SNS15	2.3	2.38

FL = Full Load, LR = Lock Rotor



FIELD WIRING

SW.#1	SWITCH #1 OPEN SWITCH
SW.#2	SWITCH #2 CLOSE SWITCH

ACTUATOR SHOWN IN OPEN POSITION

NOTES:
1) CONTROL CAN OPERATE WITH 115 or 230 VAC INPUT. **VOLTAGE INPUT SWITCH NEEDS TO BE MOVED TO POSITION THAT MATCHES THE POWER INPUT VOLTAGE.** INPUT POWER SOURCE TO BE @ 0.5A MINIMUM.
2) FUSE IS PICO STYLE, 250mA, 250VAC.
3) UNIT IS SHIPPED WITHOUT THE BATTERY PLUGGED IN. AFTER INSTALLING UNIT AND CONNECTING INCOMING POWER, PLUG BATTERY CONNECTOR INTO THE SAFE N SECURE BOARD, J1.
4) CAMS FOR LIMIT SWITCHES ARE PRESET AT THE FACTORY. TO INCREASE OR DECREASE VALVE MOTION, THE CAMS CAN BE ADJUSTED SLIGHTLY.
5) THE FAIL SWITCH NEEDS TO BE SET IN THE "RUN", "OPEN" OR "CLOSE" POSITION PRIOR TO INSTALLING THE COVER. WHEN INCOMING POWER FAILS:
"RUN" = ACTUATOR WILL CONTINUE TO RUN WITH USER COMMAND SIGNAL UNTIL BATTERY DIES.
"OPEN" = ACTUATOR WILL MOVE TO THE OPEN POSITION.
"CLOSE" = ACTUATOR WILL MOVE TO THE CLOSE POSITION.
6) INDICATOR LAMPS NEED TO BE +12VDC ONLY. NEGATIVE OF LAMP IS CONNECTED TO PIN 1 OF J6.
7) COMMAND SIGNAL USES A SINGLE POLE, DOUBLE THROW CONTACT (RELAY OR SWITCH) RATED FOR 3AMPS OR MORE.
8) WHEN INCOMING POWER IS PRESENT, BLUE LED WILL BE LIT AND ACTUATOR RUNS OFF OF INCOMING POWER. WHEN INCOMING POWER FAILS, BLUE LED WILL TURN OFF AND THE GREEN BATTERY LED WILL LIGHT - ACTUATOR WILL NOW RUN OFF OF BATTERY POWER UNTIL INCOMING POWER IS RESTORED.
9) RED LED WILL LIGHT WHEN BATTERY VOLTAGE GETS TOO LOW.

INDELAC MODEL
AS4, 6, 10

(400, 600 & 1,000 IN-LB) NEMA 4 & 7

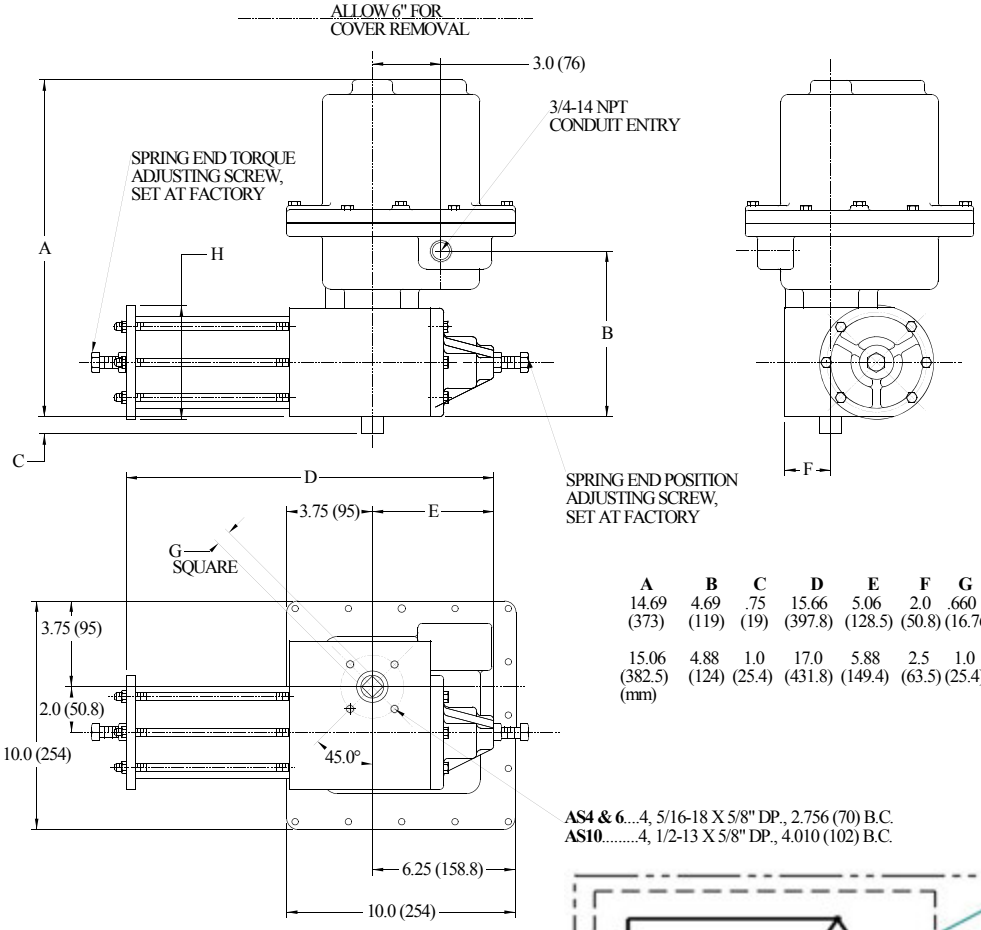
Indelac's spring return electric actuators are heavy duty, quarter turn rotary actuators. These high quality, American made actuators have been designed for use as a fail-safe solution in the industrial valve and damper automation industry. They are recommened for applications requiring system protection from unforeseen power failures.

* Recommended for applications requiring approximately 25 Open/Close cycles per day.

SPECIFICATIONS

TORQUE	AS4	400 In-Lb	(45.2 Nm)
	AS6	600 In-Lb	(67.8 Nm)
	AS10	1,000 In-Lb	(113 Nm)
CYCLE TIME	12 sec. / 90° 115 or 230 Vac		
DUTY CYCLE	25% (standard) 115 Vac or 230 Vac		
ENCLOSURE	NEMA 4 (standard) NEMA 7 (optional)		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator Wired for light indication		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	AS4/AS6	68 Lbs	
	AS10	78 Lbs	
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below		
OVERRIDE	Nondeclutching (optional)		

TECHNICAL DRAWINGS & WIRING DIAGRAM



ISO 5211 F07

MOUNTING PAD

AS4/AS6	0.66" Male
AS10	1.0" Male
ISO 5211 F07	

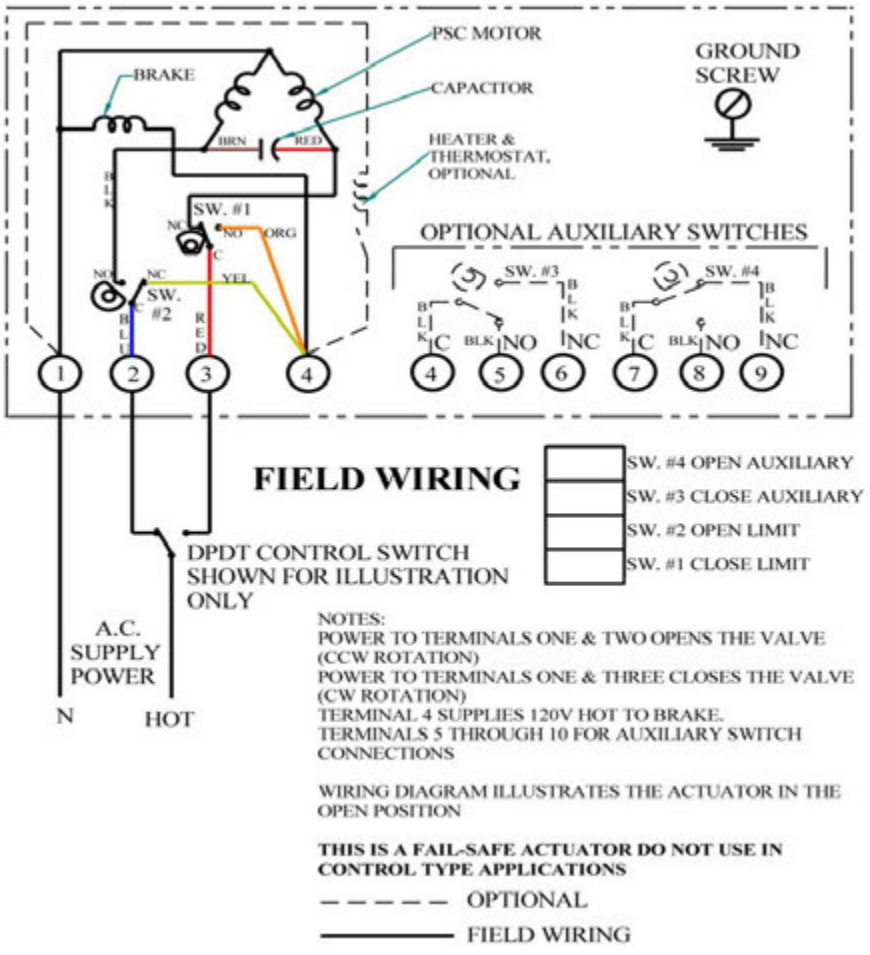
	A	B	C	D	E	F	G	H
	14.69	4.69	.75	15.66	5.06	2.0	.660	5.0
	(373)	(119)	(19)	(397.8)	(128.5)	(50.8)	(16.76)	(127)
	15.06	4.88	1.0	17.0	5.88	2.5	1.0	6.0
	(382.5)	(124)	(25.4)	(431.8)	(149.4)	(63.5)	(25.4)	(152.4)
(mm)								

AS4 & 6....4, 5/16-18 X 5/8" DP., 2.756 (70) B.C.
AS10.....4, 1/2-13 X 5/8" DP., 4.010 (102) B.C.

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

		AS4	AS6	AS10
115 Vac (Std.)	FL	1.6	1.6	1.6
	LR	2.9	2.9	2.9
208 Vac/1Ph/60Hz	FL	1.2	1.2	1.2
	LR	2.2	2.2	2.2
230 Vac/1Ph/60Hz	FL	1.03	1.03	1.03
	LR	2	2	2

FL = Full Load, LR = Lock Rotor



NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
TERMINAL 4 SUPPLIES 120V HOT TO BRAKE.
TERMINALS 5 THROUGH 10 FOR AUXILIARY SWITCH CONNECTIONS

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION

THIS IS A FAIL-SAFE ACTUATOR DO NOT USE IN CONTROL TYPE APPLICATIONS

– – – – – OPTIONAL
——— FIELD WIRING

INDELAC MODEL

ASC 4, 6 & 10

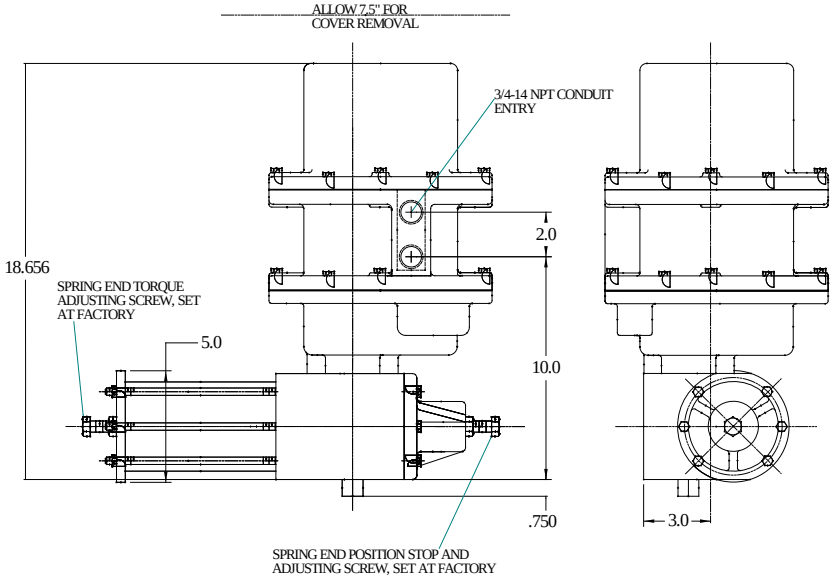
(400, 600 & 1,000 IN-LB) NEMA 4 & 7

Indelac Controls is proud to introduce models ASC4, ASC6, & ASC10. These heavy duty spring return actuators utilize an electro-mechanical clutch in order to achieve modulating control as well as DC voltage options for our already popular spring return electric actuators. ICI's new ASC series, like all of our products are 100% American made.

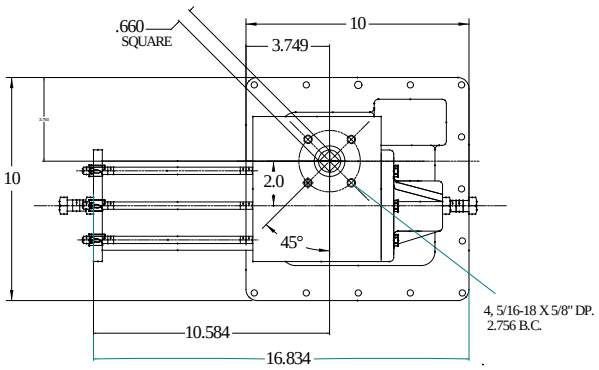
SPECIFICATIONS

TORQUE	ASC4 ASC6 ASC10	400 In-Lb 600 In-Lb 1,000 In-Lb	(45 Nm) (67 Nm) (113 Nm)
CYCLE TIME	12 sec. / 90° (all voltages)		
DUTY CYCLE	25% 115 Vac (standard) 15 min continuous (optional)		
MAX CYCLES	300 per hour		
CLUTCH	Electro-Mechanical (standard)		
ENCLOSURE	NEMA 4 (standard) NEMA 7 (optional)		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator (optional)		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	110 Lbs		
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below		
OVERRIDE	Non declutching (optional)		

TECHNICAL DRAWINGS & WIRING DIAGRAM



MOUNTING PAD
1" Male Shaft
300 Stainless steel
ISO 5211 F07 & F10



ISO 5211 F07

NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)

LOSS OF SUPPLY WILL CAUSE THE ACTUATOR TO BE SPRING DRIVEN TO THE CLOSE POSITION. UPON RETURN OF SUPPLY POWER THE ACTUATOR WILL AUTOMATICLY RETURN TO THE POSITION THE CONTROL SWITCH DESIGNATES.

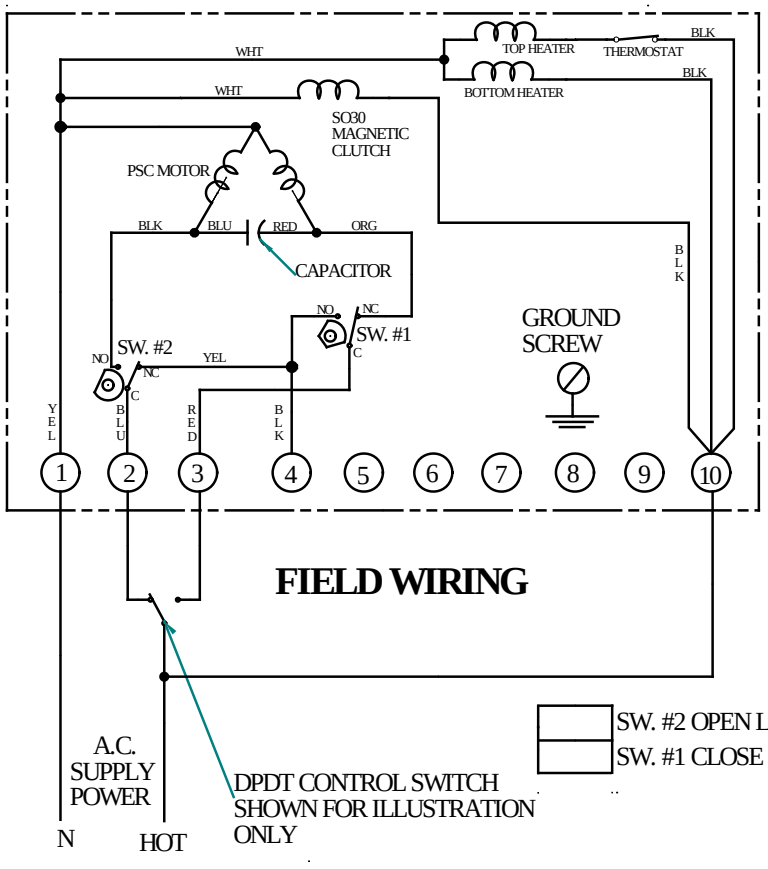
WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION.

DO NOT MOTOR DRIVE ACTUATOR INTO MECHANICAL STOP, OUTPUT PINION WILL BE DAMAGED.

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

		ASC4	ASC6	ASC10
115 Vac (Std.)	FL	1.6	1.6	1.6
	LR	2.9	2.9	2.9
24 Vac	FL	3.7	3.7	3.7
	LR	25	25	25
24 Vdc	FL	3.7	3.7	3.7
	LR	25	25	25
12 Vdc	FL	6.9	6.9	6.9
	LR	48	48	48
208 Vac/1Ph/60Hz	FL	1.2	1.2	1.2
	LR	2.2	2.2	2.2
230 Vac/1Ph/60Hz	FL	1.03	1.03	1.03
	LR	2	2	2

FL = Full Load, LR = Lock Rotor



INDELAC MODEL

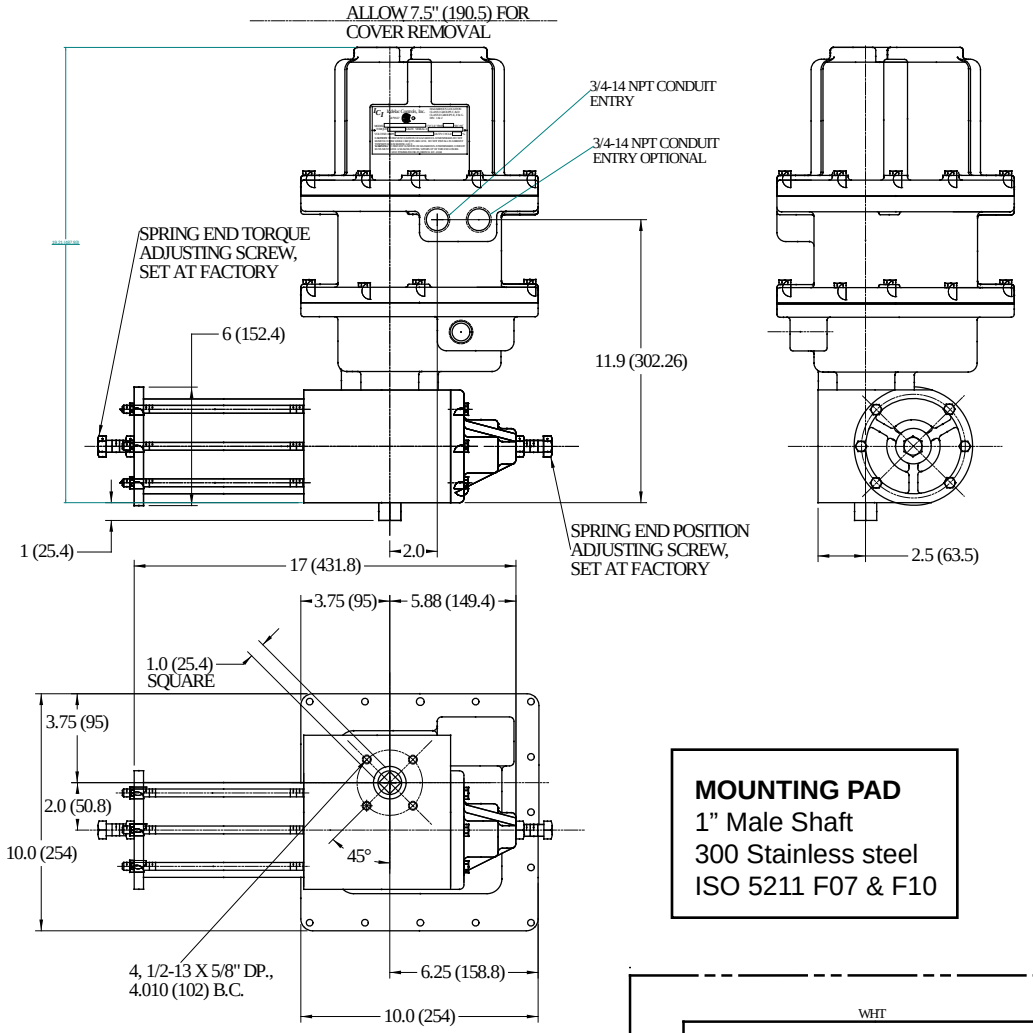
ASC 12

(1,200 IN-LB) NEMA 4 & 7

Indelac Controls is proud to introduce model ASC12. This heavy duty spring return actuator utilizes an electro-mechanical clutch in order to achieve modulating control as well as DC voltage options for our already popular spring return electric actuators while providing up to 1,200 In-Lb of spring end torque.

SPECIFICATIONS			
TORQUE	ASC12	1,200 In-Lb	(135 Nm)
CYCLE TIME	12 sec. / 90° (all voltages)		
DUTY CYCLE	25% 115 Vac (standard) 15 min continuous (optional)		
MAX CYCLES	300 per hour		
CLUTCH	Electro-Mechanical (standard)		
ENCLOSURE	NEMA 4 (standard) NEMA 7 (optional)		
COATING	Thermally bonded polyester powder		
POSITION IND.	Visual indicator (optional)		
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac		
LUBRICATION	Permanent		
WEIGHT	110 Lbs		
INSTALLATION	Universal		
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below		
OVERRIDE	Non declutching (optional)		

TECHNICAL DRAWINGS & WIRING DIAGRAM



ISO 5211 F07

MOUNTING PAD
1" Male Shaft
300 Stainless steel
ISO 5211 F07 & F10

MOTOR SPECIFICATIONS
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

115 Vac (Std.)	FL	1.2
	LR	-
24 Vac	FL	5
	LR	25
24 Vdc	FL	5
	LR	25
12 Vdc	FL	10
	LR	48
208 Vac/1Ph/60Hz	FL	1.2
	LR	2.2
230 Vac/1Ph/60Hz	FL	1.03
	LR	2

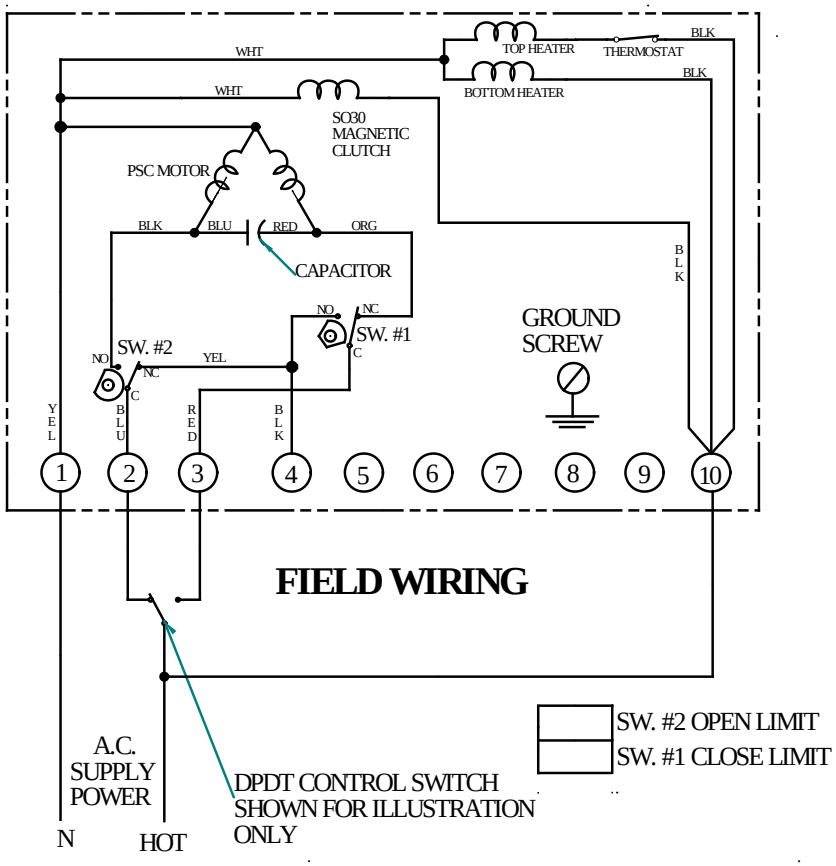
FL = Full Load, LR = Lock Rotor

NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)

LOSS OF SUPPLY WILL CAUSE THE ACTUATOR TO BE SPRING DRIVEN TO THE CLOSE POSITION. UPON RETURN OF SUPPLY POWER THE ACTUATOR WILL AUTOMATICLY RETURN TO THE POSITION THE CONTROL SWITCH DESIGNATES.

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION.

DO NOT MOTOR DRIVE ACTUATOR INTO MECHANICAL STOP, OUTPUT PINION WILL BE DAMAGED.



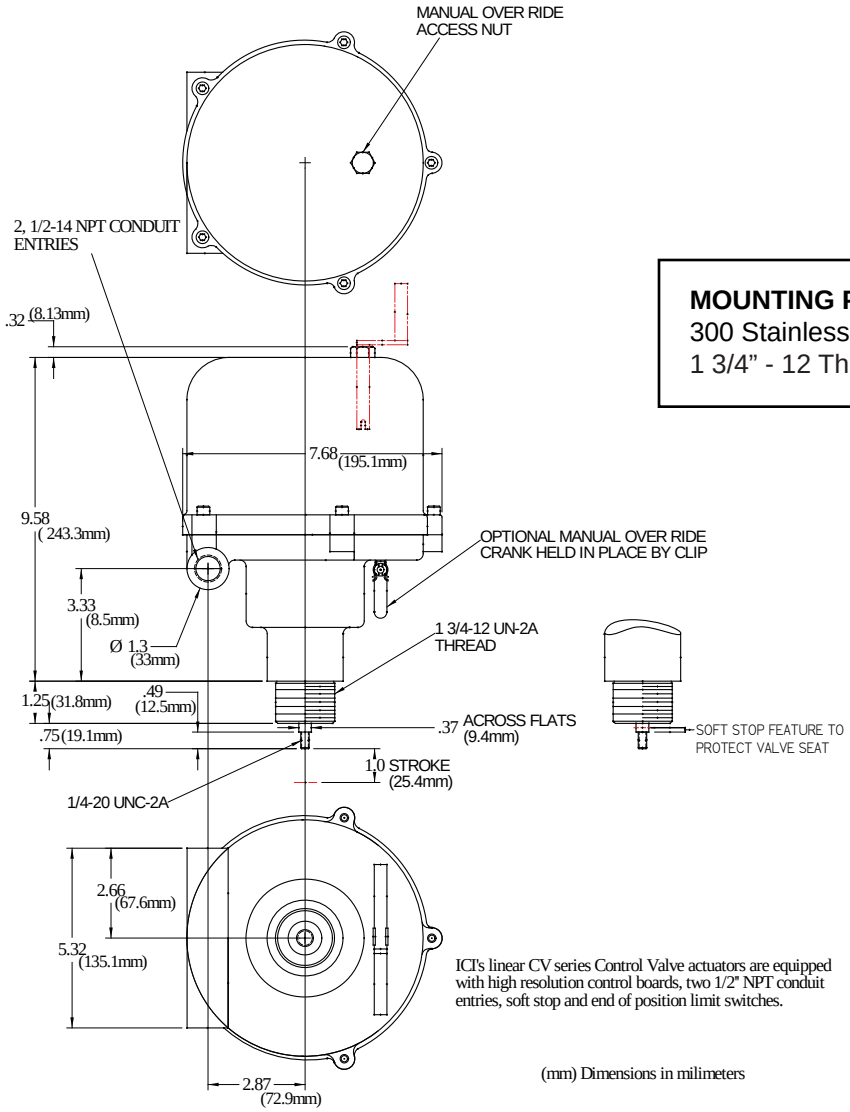
INDELAC MODEL
CV Series

(165 IN-LB THRUST) NEMA 4 & 7

ICI's electric linear actuators are high quality, industrial grade machines designed for control valve automation. They are recommended for applications ranging from on/off to modulating process control. Indelac's linear actuators utilize precision ball screw technology to convert rotary motion to linear travel. The ball screw efficiently (>90%) converts rotary power (torque) to linear force in pounds thrust. Our ball screw drive system offers the most cost effective combination of speed, accuracy, efficiency, position repeatability, and quiet operation available on today's valve automation equipment. ICI's linear actuators are available from 12 Vdc to 230 Vac-1Ph. They are available in direct drive as well as spring return versions. The unique clutch/ball screw technology on our spring return models assures positive shut off regardless of valve position when power is lost.

SPECIFICATIONS	
THRUST	165 In-Lb (18.5 Nm)
CYCLE TIME	9.6 IPM
DUTY CYCLE	75%
ENCLOSURE	NEMA 4, 4X, 9 & 7 for Class I, Groups C & D, Class II, Groups E, F, & G, Division 1 & 2 Hazardous Location
COATING	Thermally bonded polyester powder
POSITION IND.	4-20mA (optional)
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac
POTENTIOMETER	Linear
LUBRICATION	Permanent
WEIGHT	20 Lbs
INSTALLATION	Universal
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below
OVERRIDE	Manual, Non declutching (standard)

TECHNICAL DRAWINGS & WIRING DIAGRAM



MOUNTING PAD
300 Stainless steel
1 3/4" - 12 Thread

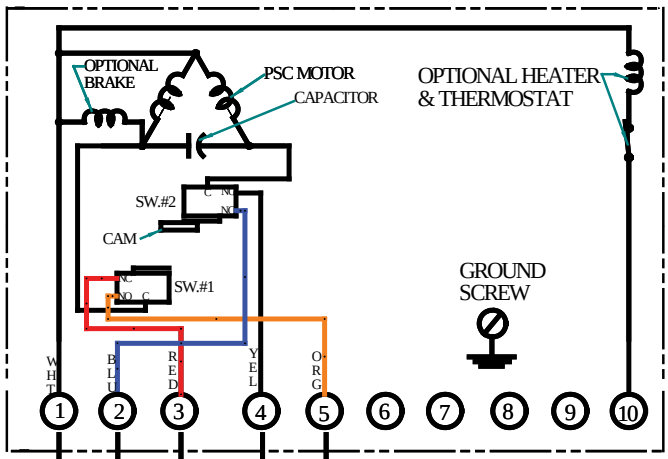
ICI's linear CV series Control Valve actuators are equipped with high resolution control boards, two 1/2" NPT conduit entries, soft stop and end of position limit switches.

(mm) Dimensions in milimeters

MOTOR
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

- 115 Vac (Std.)
- 24 Vac
- 24 Vdc
- 12 Vdc

Voltages Available

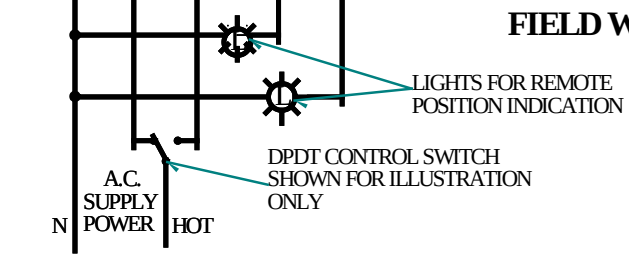


SW. #2 RETRACT LIMIT
SW. #1 EXTEND LIMIT

NOTES:
POWER TO TERMINALS ONE & TWO OPENS THE VALVE (RETRACTS STEM)
POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (EXTENDS STEM)
TERMINALS 4 & 5 ARE FOR LIGHT INDICATION

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION

FIELD WIRING



INDELAC MODEL
12 SERIES

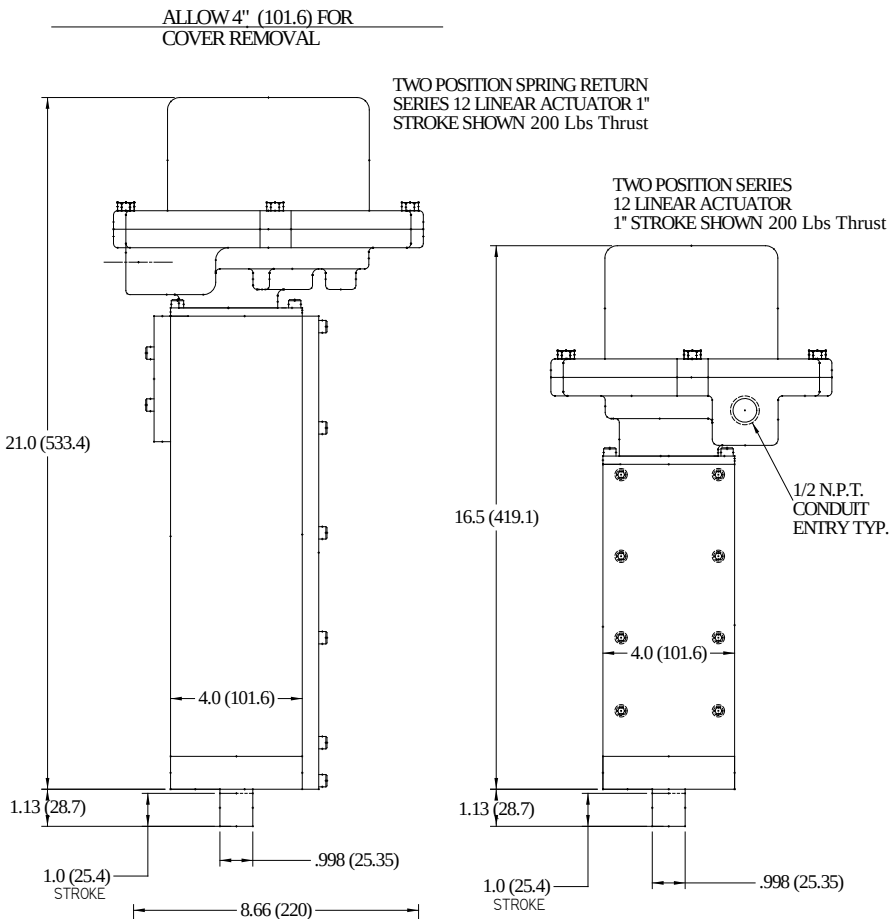
(200 TO 1,900 IN-LB THRUST) NEMA 4

ICI's electric linear actuators are high quality, industrial grade machines designed for control valve automation. They are recommended for applications ranging from on/off to modulating process control. Indelac's linear actuators utilize precision ball screw technology to convert rotary motion to linear travel. The ball screw efficiently (>90%) converts rotary power (torque) to linear force in pounds thrust. Our ball screw drive system offers the most cost effective combination of speed, accuracy, efficiency, position repeatability, and quiet operation available on today's valve automation equipment. ICI's linear actuators are available with voltages from 12 Vdc to 230 Vac-1Ph. They are available in direct drive as well as spring return versions. The unique clutch/ball screw technology on our spring return models assures positive shut off regardless of valve position when power is lost.

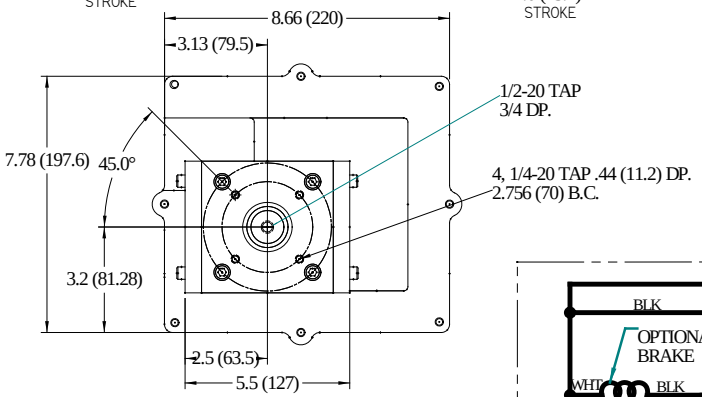
SPECIFICATIONS

THRUST	200-1,900 In-Lb	(22.6-214.7 Nm)
CYCLE TIME	3 IPM	
DUTY CYCLE	75% 115 Vac (standard)	
ENCLOSURE	NEMA 4 (standard)	
COATING	Thermally bonded polyester powder	
POSITION IND.	Wired for light indication	
SWITCHES	SPDT snap action, 15 Amps @ 250 Vac (optional on 4-20mA control)	
LUBRICATION	Permanent	
WEIGHT	16 Lbs (Model 12-2N1B)	
INSTALLATION	Universal	
TEMP. RANGE	-40°F to 150°F Heater & Thermostat required 0°F & below	
OVERRIDE	Manual (optional)	

TECHNICAL DRAWINGS & WIRING DIAGRAM



MOUNTING PAD
300 Stainless steel shaft
ISO 5211 F05 BC

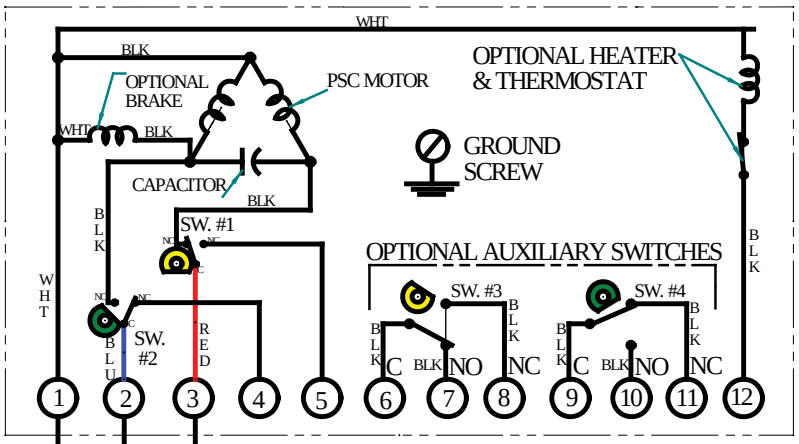


ISO 5211 F07

MOTOR
Permanent split capacitor
115 Vac / 1Ph / 50-60 Hz (standard)
with thermal over load protection

- 115 Vac (Std.)
- 24 Vac
- 24 Vdc
- 12 Vdc
- 230 Vdc

Voltages Available



NOTES:
POWER TO TERMINALS 1& 2 OPENS THE VALVE (CCW ROTATION)
POWER TO TERMINALS 1 & 3 CLOSES THE VALVE (CW ROTATION)
TERMINALS 4 & 5 FOR LIGHT INDICATION
TERMINALS 6 THROUGH 11 FOR AUXILIARY SWITCH CONNECTIONS
TERMINAL 12 HOT FOR HEATER & THERMOSTAT

WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION

INDELAC MODEL
IP SERIES

DOUBLE ACTING & SPRING RETURN PNEUMATIC ACTUATOR

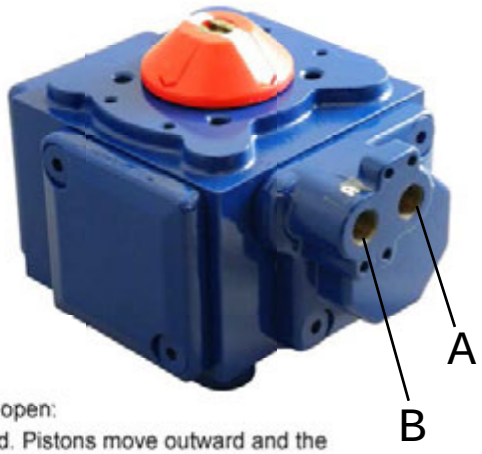
The IP series is a quarter turn rack and pinion pneumatic actuator that is patented worldwide. The superiority of the IP series actuator over single and double rack and pinion actuator designs, results from the four pistons which generate torque around a centrally located pinion, thereby giving more than double the torque achieved by other designs. The increased number of pistons in the actuator allows their diameter to be reduced while maintaining its high torque. This also allows the overall size of the actuator to be reduced and become more compact.

SPECIFICATIONS

AIR SUPPLY	NAMUR G1/4”		
SIL RATING	3		
ENCLOSURE	ISO 9001 Certification, ATEX 94-9-EC approved to category 2 for use in potentially explosive areas.		
COATING	Anodized internally and externally with an external epoxy base layer and a second polyurethane paint to protect against aggressive environments. (standard) Electroless nickel coating of the body, covers, and stop (optional)		
POSITION IND.	Visual position indication		
WEIGHT	**DOUBLE ACTING**	IPDA15	2.0 Lbs.
		IPDA20	3.3 Lbs.
		IPDA25	6.2 Lbs.
		IPDA30	9.7 Lbs.
		IPDA35	15.7 Lbs.
		IPDA45	24.3 Lbs.
		IPDA60	57.3 Lbs.
		IPDA75	113 Lbs.
	SPRING RETURN	IPSR15	2.4 Lbs.
		IPSR20	4.2 Lbs.
		IPSR25	7.7 Lbs.
		IPSR30	11 Lbs.
		IPSR35	19.8 Lbs.
		IPSR45	33.1 Lbs.
		IPSR60	77.2 Lbs.
		IPSR75	141 Lbs.
TEMP. RANGE	Buna N	-4°F to 176°F	
	Viton	-4°F to 250°F	
	EPDM	-40°F to 176°F	

PORTS & SPRING COMBINATIONS

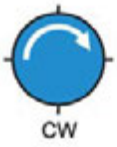
The IP Series actuator transforms the linear motion of its pneumatic pistons into rotary motion via 4 gear racks that drive the central pinion Air Supply to drive the pistons flows into port A of the NAMUR cover: Port A is connected to the center chamber and port B is connected to the four outside chambers.



Spring Return (SR)

Pressure entering Port A to open:
Center chamber pressurized. Pistons move outward and the pinion rotates counter clockwise (CCW).
Springs are compressed.

Pressure exiting Port A to close:
Air released from center chamber. Springs drive pistons inward.

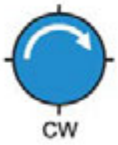


Double Acting (DA)

Pressure entering Port A to open:
Center chamber pressurized. Pistons move outward and the pinion rotates counter clockwise (CCW).

Pressure entering Port B to close:

Outside chambers pressurized. Pistons move inward and the pinion rotates clockwise (CW).



OUTER
MIDDLE
INNER

CODE	Spring Combinations
1A	
1B	
1B2	
2	

CODE	Spring Combinations
2AB	
2A	
2A2B	
2B	

CODE	Spring Combinations
2A3	
2C	
2C3	
3	

Sizing a spring return actuator requires that the torque output at the start and end of both the spring and air driven strokes is greater than the valve torque at that position.

TORQUE CHART

Double Acting

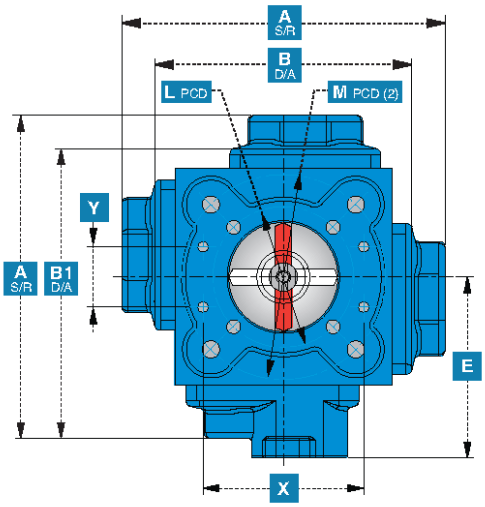
IMPERIAL (in-lb)
METRIC (Nm)

Size	Operating Pressure (psi)			Operating Pressure (bar)		
	60	80	100	4.0	5.5	7.0
IPDA15	125	172	207	14	19	24
IPDA20	229	311	390	25	35	45
IPDA25	476	639	802	52	72	92
IPDA30	769	1,052	1,334	84	119	153
IPDA35	1,382	1,848	2,311	151	208	265
IPDA45	2,719	3,622	4,525	297	408	519
IPDA60	6,436	8,585	10,725	703	967	1,230
IPDA75	11,893	15,856	19,819	1,299	1,786	2,273

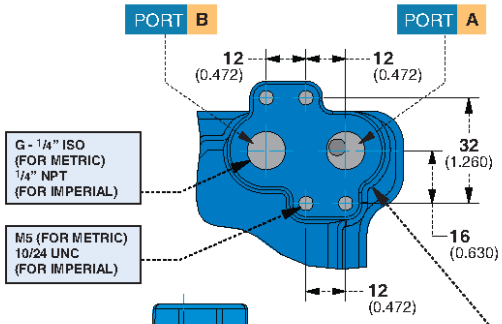
Spring Return

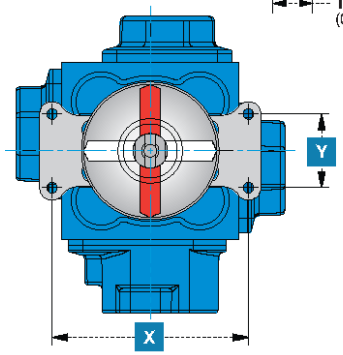
Size	Spring set	Air Stroke - psi						Spring Stroke		Air Stroke - bar						Spring Stroke	
		60		80		100				4.0		5.5		7.0			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
IPSR15	1A	91	65	135	111	171	147	53	27	10	7	15	12	20	17	6	3
	1B	**74**	**40**	119	86	155	123	80	44	**8**	**4**	13	10	18	14	9	5
	1B2			**102**	**61**	139	98	106	62			**12**	**7**	16	11	12	7
	2					**123**	**74**	133	80					**14**	**8.5**	15	9
IPSR20	2AB	158	110	241	192	320	270	111	66	17	12	27	22	37	31	12	7
	2A	**144**	**88**	227	170	307	249	133	80	**16**	**10**	26	19	35	29	15	9
	2A2B	126	62	210	145	289	223	159	97	14	7	24	16	33	26	18	11
	2B			**192**	**119**	272	198	186	115			**22**	**13**	31	23	21	13
	2A3			**178**	**109**	258	188	197	129			**20**	**12**	30	22	22	15
	2C			166	85	**246**	**165**	221	142			19	10	**28**	**19**	25	16
	2C3					**235**	**151**	236	154					**27**	**17**	27	17
	3					208	127	257	168					24	15	29	19
IPSR25	2AB	349	251	514	413	676	573	208	117	38	27	58	47	78	66	23	13
	2A	327	212	492	376	655	537	247	139	36	23	55	42	75	62	28	16
	2A2B	**307**	**178**	472	343	636	505	281	159	**33**	**19**	53	39	73	58	32	18
	2B			446	303	610	465	322	186			50	34	70	53	36	21
	2A3			**421**	**258**	586	421	370	211			**47**	**29**	67	48	42	24
	2C			**397**	**217**	562	381	412	235			**45**	**24**	**64**	44	47	27
	2C3					**545**	**331**	464	253			43	19	**63**	**38**	52	29
	3					**524**	**293**	504	274					60	**34**	57	31
IPSR30	2AB	566	435	851	715	1,132	991	306	188	62	47	96	81	130	114	35	21
	2A	523	369	809	652	1,091	929	372	230	57	40	91	73	125	107	42	26
	2A2B	**478**	**272**	765	558	1,048	837	469	274	**52**	**30**	86	63	120	96	53	31
	2B	439	165	721	482	1,005	762	549	319	48	18	81	54	115	87	62	36
	2A3			**687**	**420**	971	701	613	354			**77**	**47**	111	80	69	40
	2C			**651**	**345**	936	628	690	389			**73**	**39**	107	72	78	44
	2C3					**892**	**545**	778	435					**102**	**62**	88	49
	3					**850**	**477**	850	478					**98**	**55**	96	54
IPSR35	2AB	1,077	784	1,544	1,248	2,005	1,701	547	280	118	86	174	141	230	195	62	32
	2A	1,019	681	1,488	1,148	1,950	1,603	651	336	111	74	168	129	224	184	74	38
	2A2B	**920**	**565**	1,392	1,035	1,855	1,492	767	434	**100**	**62**	157	117	213	171	87	49
	2B			1,313	880	1,778	1,339	929	513	**92**	**44**	148	99	204	154	105	58
	2A3			**1,251**	**747**	1,717	1,210	1,067	576			**141**	**84**	197	139	121	65
	2C			**1,182**	**607**	1,649	1,071	1,213	646			**133**	**68**	189	123	137	73
	2C3					1,575	973	1,316	723					181	112	149	82
	3					**1,512**	**869**	1,427	788					**173**	**100**	161	89
IPSR45	2AB	2,030	1,445	2,939	2,347	3,840	3,235	1,173	636	222	158	331	264	440	371	133	72
	2A	1,900	1,213	2,813	2,122	3,716	3,013	1,408	764	208	132	317	239	426	346	159	86
	2A2B	**1,800**	**1,033**	2,716	1,948	3,621	2,842	1,589	862	**197**	**113**	306	219	415	326	179	97
	2B			2,560	1,671	3,468	2,571	1,876	1,020	179	82	288	188	398	295	212	115
	2A3			**2,434**	**1,444**	3,343	2,348	2,111	1,148			**274**	**163**	383	269	239	130
	2C			**2,307**	**1,218**	3,220	2,126	2,346	1,276			**260**	**137**	369	244	265	144
	2C3					**3,099**	**1,904**	2,581	1,400					**355**	**218**	292	158
	3					**2,975**	**1,682**	2,815	1,527					**341**	**193**	318	173
IPSR60	2AB	4,874	3,528	7,035	5,671	9,168	7,771	2,670	1,438	532	385	792	639	1,052	891	302	162
	2A	4,591	3,015	6,761	5,174	8,899	7,283	3,185	1,716	501	329	762	583	1,021	835	360	194
	2A2B	**4,372**	**2,607**	6,548	4,778	8,690	6,894	3,597	1,931	**478**	**285**	738	538	997	791	406	218
	2B			6,232	4,213	8,379	6,339	4,183	2,251	**442**	**221**	702	475	961	727	473	254
	2A3			5,920	3,649	8,073	5,785	4,769	2,566			667	411	926	663	539	290
	2C			**5,634**	**3,129**	7,792	5,275	5,309	2,857			**635**	**352**	894	605	600	323
	2C3					7,505	4,762	5,851	3,152					861	546	661	356
	3					**7,234**	**4,270**	6,371	3,432					**830**	**490**	720	388
IPSR75	2AB	9,083	6,915	13,066	10,856	17,015	14,738	4,534	2,583	992	755	1,472	1,223	1,951	1,690	512	292
	2A	8,556	6,014	12,556	9,982	16,514	13,880	5,441	3,099	935	657	1,414	1,124	1,894	1,592	615	350
	2A2B	**8,154**	**5,327**	12,165	9,317	16,130	13,227	6,132	3,495	**891**	**582**	1,370	1,049	1,850	1,517	693	395
	2B			11,535	8,239	15,512	12,169	7,251	4,132	**820**	**461**	1,299	928	1,779	1,396	819	467
	2A3			11,025	7,368	15,010	11,313	8,155	4,649			1,242	830	1,722	1,298	921	525
	2C			**10,514**	**5,593**	14,509	10,455	9,063	5,166			**1,184**	**632**	1,664	1,199	1,024	584
	2C3					14,008	9,599	9,967	5,682			**1,127**	**633**	1,607	1,101	1,126	642
	3					**13,507**	**8,743**	10,873	6,199					**1,549**	**1,003**	1,229	700

TECHNICAL DRAWING

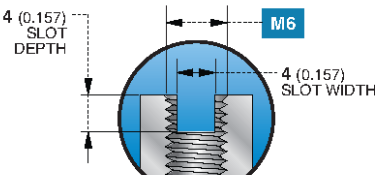


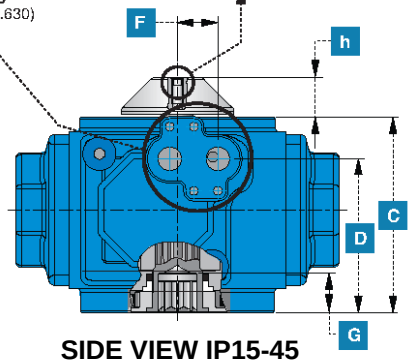
TOP VIEW IP15-45



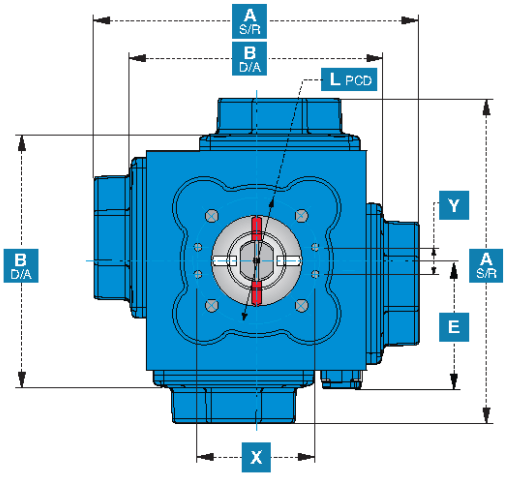


TOP VIEW IP15 ONLY
VDI/VDE Brackets on request

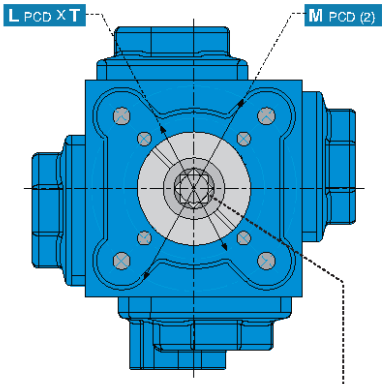




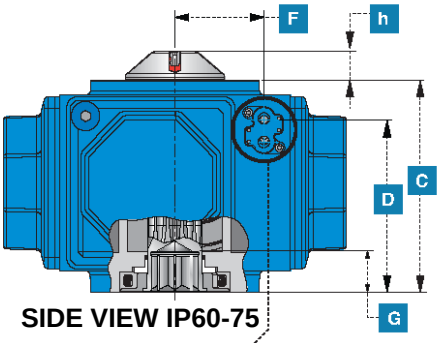
SIDE VIEW IP15-45



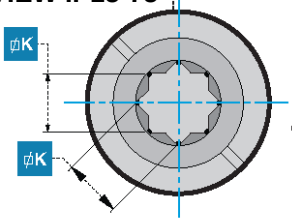
TOP VIEW IP60-75

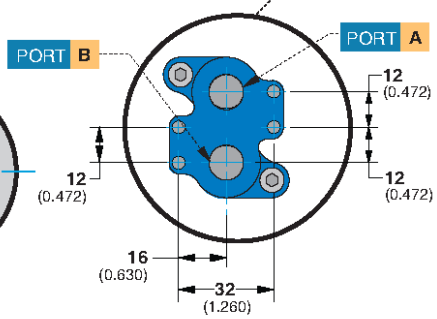


BOTTOM VIEW IP15-75



SIDE VIEW IP60-75





VDI/VDE 3845	
SIZES	X x Y x h
IP15-45	80 x 30 x 20
IP60-75	130 x 30 x30

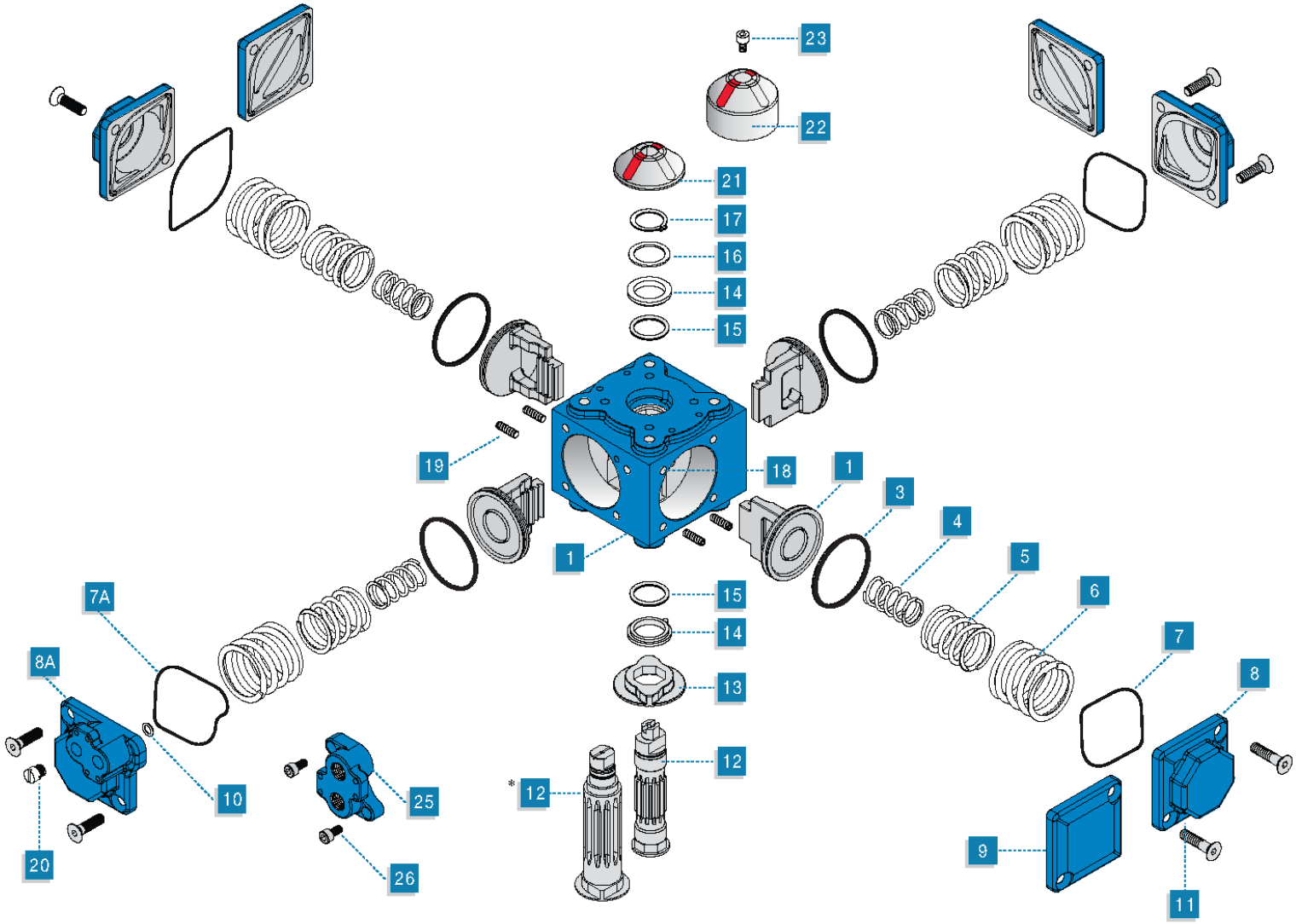
PORT **A** connected to the center chamber

PORT **B** connected to the outside chambers

SIZE*	A S/R		B D/A		B1 D/A		C		D		E		F		G		ØK		L PCD		T Thread		M PCD (2)	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
IP15	110	4.31	86.0	3.39	97.8	3.85	68.8	2.71	50.8	2.00	66.0	2.60	16.0	0.63	13.5	0.53	9.0	0.35	50 (F05)	1.97 (F05)	M6	1/4"	-	-
IP20	131	5.17	102	4.03	117	4.60	80.5	3.17	61.5	2.42	77.2	3.04	16.5	0.65	15.0	0.59	11.0	0.43	50 (F05)	1.97 (F05)	M6	1/4"	70 (F07)	2.76 (F07)
IP25	161	6.34	132	5.24	147	5.79	97.0	3.82	76.5	3.01	90.0	3.54	20.0	0.79	19.5	0.77	14.0	0.55	70 (F07)	2.76 (F07)	M8	5/16"	102 (F10)	4.02 (F10)
IP30	186	7.33	151	5.94	169	6.64	116	4.58	93.4	3.68	105	4.15	22.3	0.88	22.0	0.87	17.0	0.67	70 (F07)	2.76 (F07)	M8	5/16"	102 (F10)	4.02 (F10)
IP35	222	8.74	182	7.15	202	7.94	135	5.31	102	4.02	114	4.48	22.5	0.89	26.0	1.02	22.0	0.87.	102 (F10)	4.02 (F10)	M10	3/8"	-	-
IP45	269	10.59	221	8.70	245	9.65	164	6.46	127	5.00	147	5.79	31.0	1.22	33.0	1.30	27.0	1.06	125 (F12)	4.92 (F12)	M12	1/2"	102 (F10)	4.02 (F10)
IP60	360	14.17	285	11.22	-	-	218	8.58	180	7.09	141	5.57	94.0	3.70	43.0	1.69	36.0	1.42	140 (F14)	5.51 (F14)	M16	5/8"	-	-
IP75	437	17.20	342	13.46	-	-	270	10.63	223	8.76	166	6.54	110	4.33	43.0	1.69	36.0	1.42	140 (F14)	5.51 (F14)	M16	5/8"	-	-

** The IP45 bottom PCD (L) can be either F12 or F10, but not both. The standard is F12.*

PARTS LIST



	Description	Qty	Material
1	Body	1	AL 356-T6
2	Piston	4	AL 356/380
3	Piston O-Ring	4	Buna N, Viton, EPDM
4	Inner Spring	4	Spring steel, Painted
5	Middle Spring	4	Spring steel, Painted
6	Outer Spring	4	Spring steel, Painted
7	Cover O-Ring	3	Buna N, Viton, EPDM
7a	Namur Cover O-Ring	1	Buna N, Viton, EPDM
8	Spring Return Cover	3	AL 356/380
8a	Namur Cover	1	AL 356/380
9	Double Acting Cover	3	AL 356/380
10	Air Supply O-Ring	1	Buna N, Viton, EPDM
11	Cover Screw	8-16	ST. ST.
12	Pinion	1	Steel E.N.Coated

	Description	Qty	Material
13	Stop	1	ST.ST 316
14	Thrust Washer	2	Delrin, NRG, UHMWPE
15	Pinion O-Ring	2	Buna N, Viton, EPDM
16	Disc Bearing	1	ST.ST / Delrin
17	Circlip	1	ST.ST
18	Pad	4	Delrin, NRG, UHMWPE
19	Stroke Adjustment Screw	4	ST. ST.
20	Exhaust Plug (Silencer)	1	Delrin, (Brass)
21	Indicator	1	Plastic (ABS), Red & White
22	Puck	1	Plastic (ABS), Red & White
23	Indicator Screw	1	ST.ST
24	Tag (not shown)	4	ST.ST
25	Namur insert	1	AL 380
26	Insert screw	2	ST.ST

INDELAC MODEL
POSICION +®

LIGHT WEIGHT CORROSION RESISTANT POSITION TRANSMITTER

Indelac controls is proud to introduce Model VT56, the first of our new *posICIon+* series position transmitters. ICI's new *posICIon+* series, like all of our products is 100% American made.

Model VT56 is a light weight corrosion resistant position transmitter manufactured from high impact resistant polycarbonate plus 20% fiberglass. With brass insert for all mounting connections for greater thread strength.

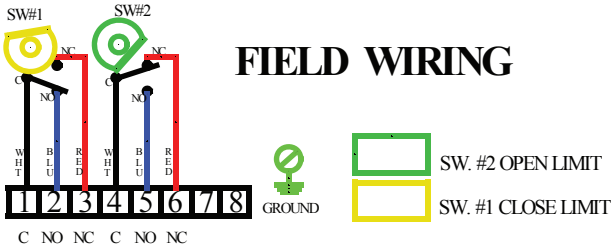
The *posICIon+* is also equipped with 300 series stainless steel drive shaft and fasteners. With captive cover screws there is no chance of dropping and loosing fasteners during commissioning of your project.

The dome style visual position indicator provides local position indication at a glance. To set ICI's *posICIon+* position transmitters limit switches simply operate the actuator to the open position, push the top cam down and rotate to the desired postion then operate the actuator to the close position pull the lower cam up and rotate to the desired position. The interlocking, spring loaded cams assure accuracy, repeatable and reliable position indication.

*See installation manual for detailed instructions.

This above picture displays model VT56 which is designed to meet NEMA Type 4 and 4X as well as International Protection Code IP56 environmental conditions. This model is ideal for indoor or outdoor applications.

SPECIFICATIONS	
ENCLOSURE	NEMA 4 & 4X
POSITION IND.	Dome Style Visual Indication Wired for light indication
SHAFT & FASTENERS	303 Stainless steel
CONDUIT ENTRIES	(2) x 1/2" NPT
SEALS	Buna N
SWITCHES	2 x SPDT
TERMINAL POINTS	8
TEMP. RANGE	-40°F to 140°F



INDELAC MODEL
FAIL-SAFE SYSTEMS

ELECTRIC FAIL-SAFE DEVICE / BATTERY BACK-UP SYSTEMS

Indelac's Electric Fail-Safe Device / Battery Back-up Systems are designed for critical industrial valve and damper applications to protect against damage to manufacturing process or loss of process material upon unexpected loss of power. These systems offer seamless transfer from utility power to back-up power and back to utility power when power is restored. Our standard models provide ample time to operate the valve or damper to the designated fail position and several additional operational cycles if required (optional). If our standard units do not meet your requirements our engineering team will design a system to your specifications for specific application.

SPECIFICATIONS

AMP RATINGS:
3.0 Amps, 5.0 Amps, 7.0 Amps, & 10 Amps

VOLTAGE RATINGS:
115 Vac, 230 Vac-1Ph, 24 Vdc (Supply & Output)

WATTAGE RATINGS:
100 to 2,000 watts continuous output power

RATED OUTPUT DURATION:
Designed to operate a minimum of 12 min. continous

ENCLOSURE RATINGS:
NEMA 4, 4X, 7, 4/7, 4X/7

ELECTRIC FAIL-SAFE PLACEMENT GUIDE

*The given distances should be considered as maximums

Fail-Safe Watts	Actuator Series	Wire Gage Size				
		12	10	8	6	4
300	R	40ft	65ft	75ft	90ft	115ft
	S, SD, MS & MR	30ft	50ft	60ft	75ft	95ft
	SX & SDX	25ft	45ft	55ft	70ft	85ft
	ML & MH	25ft	45ft	55ft	70ft	85ft
700	LA	-	-	35ft	50ft	65ft
	LX & 5K	-	-	30ft	45ft	60ft
	7K	-	-	10ft	25ft	40ft
1000	12K & 14K	-	-	10ft	25ft	40ft

FEATURES - OPTIONS - BENEFITS

- Including Auto Transfer Switching for battery back-up / UPS operation.
- Reliability enhanced large-transformer design with protected DC terminals
- 120 Vac-1Ph-60Hz modified sine wave output power standard
- Built in surge protection
- System Test Switch
- One unit can supply power to multiple actuators at the same time (optional)
- Local On/Off switch (optional)
- Amber = power fail confirmation indication light (optional), Green = power ON indication light & Red = loss of power indication light Red = loss of power indication light

INDELAC CONTROLS, INC. FLORENCE, KY 41042 TOLL FREE: 1-800-662-9424 www.INDELAC.com

INDELAC MODEL
CONTROL PANELS

Indelac's control panels are designed to provide dependable operation as well as meet NEMA 4 specifications. While ICI offers a number of standard control panels we also design special controls for various applications. If your needs do not fall within the realm of our standard control panels please call or email your specifications for design consideration.

OPEN/CLOSE PUSH BUTTONS

Model PBOC-10 is a compact push button control station normally located at the actuator, however there are many applications requiring that the control be in a distant location. It is available with momentary contact or mechanical interlocking switches to meet the specific requirement of the application. This control package is supplied with a NEMA Type 4 enclosure (additional enclosure available) and is equipped with lights for position indication. This control panel can be used in numerous applications where on/off control is required.

OPEN/CLOSE SELECTOR SWITCHES

Model SSOC-10 is a compact control station similar to model PBOC-10 except a selector switch is applied instead of the push buttons used on model PBOC-10. This control package can be located at the actuator or at a remote location of the actuator being controlled. The enclosure is NEMA Type 4 (other enclosure available) and is equipped with indicating lights for position indication. This control panel is ideal for applications requiring on/off control remote or local to the actuator.

REMOTE/OFF/LOCAL

This control package is available on all ICI electric actuators. It is normally mounted on the actuator but can be mounted along side he actuator and hard wired to the actuator. These control panels are equipped with NEMA Type 4 enclosures as standard (other enclosure available). Standard equipment also includes open/close light indication, Remote/Off/Local selector switch, mechanically interlocking open/close push buttons (or selector type open/stop/close switch) and well-marked terminal strip for field commissioning.

4-20MA SIGNAL TRANSMITTER

This control panel transmits a 4 to 20mA analog signal to provide proportional position control of flow, pressure or temperature in a varity of applications. This control package can be used in process control or throttling applications.

INDELAC MODEL
THERMOARMOR

THERMAL BLANKET FOR ALL ACTUATOR SERIES

Introduction

Indelac ThermoArmor Thermal Blanket is a custom fit high quality pre-engineered insulation system designed to save energy, retain radiant heat, minimize insulation maintenance and improve the surrounding work environment. ThermoArmor is also capable of withstanding weather conditions and chemical environments. ThermoArmor is flexible and easy to install, easy to remove and reinstall allowing quick access and easy equipment serviceability.

Maximum Service Temperature

This design is to act as a Thermal Barrier with a maximum service temperature of 550°F (288°C).

Product Components

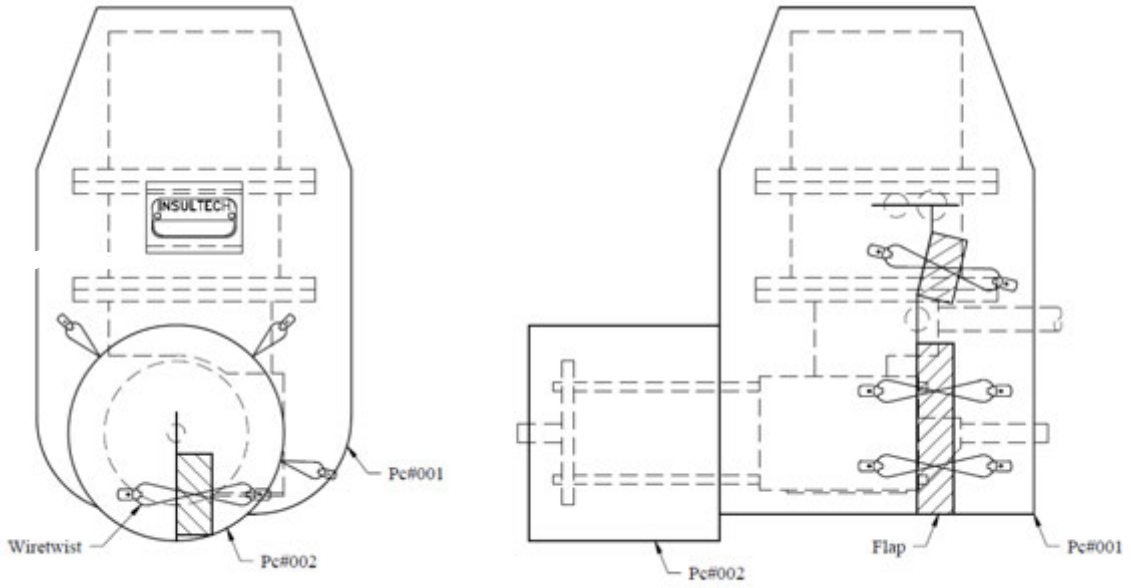
The Outer and Inner Jacket is a 16.5 oz/sq. yd. PTFE Teflon® impregnated Fiberglass cloth. The Insulation Material is an 11PCF Fiberglass Needled Mat – Type "E" fiber. The inner jacket also has a layer of Stainless Steel Type 304 Knitted Wire Mesh. The ThermoArmor Blanket system includes fasteners for easy install and removal.

Warranty

We guarantee that all custom manufactured blankets will accommodate all acutators and fit correctly for optimum performance as per the design specification provided in the quotation process. In addition, for 12 months we will cover the cost of replacing the blanket should the failure be due to premature degradation of any component utilized in the blanket construction, as well as any defects due to poor workmanship.

Blanket Thickness Surface Temperature Reference			
Thickness	1"	1.5"	2"
Operating Temperature	*Surface Temperature*		
350 °F	117 °F	105 °F	97 °F
400 °F	126 °F	111 °F	103 °F
450 °F	135 °F	118 °F	108 °F
500 °F	145 °F	125 °F	114 °F
550 °F	154 °F	132 °F	120 °F

Technical Drawing



Side Elevation **Front Elevation**

High Temperature Operation Test

Recently ICI submitted one of our ACS electric spring return actuators incased in our ThermoArmor blanket for high temperature operational testing. The purpose of the test was to verify that our ASC Series spring return actuator meets the specifications for **use in tunnel application**.

The actuator was installed in an environmental chamber then the temperature inside the chamber was ramped up to 482°F (250°C). The actuator was inside the chamber for duration of two hours and was powered open then closed every ten minutes.

After the test was completed the actuator was inspected to determine the effect of high temperature exposure while protected by our ThermoArmor thermal blanket. As can be seen in the picture dated 01-02-14 the ASC actuator suffered no damage.

To see complete results of the test, visit our website at www.indelac.com.

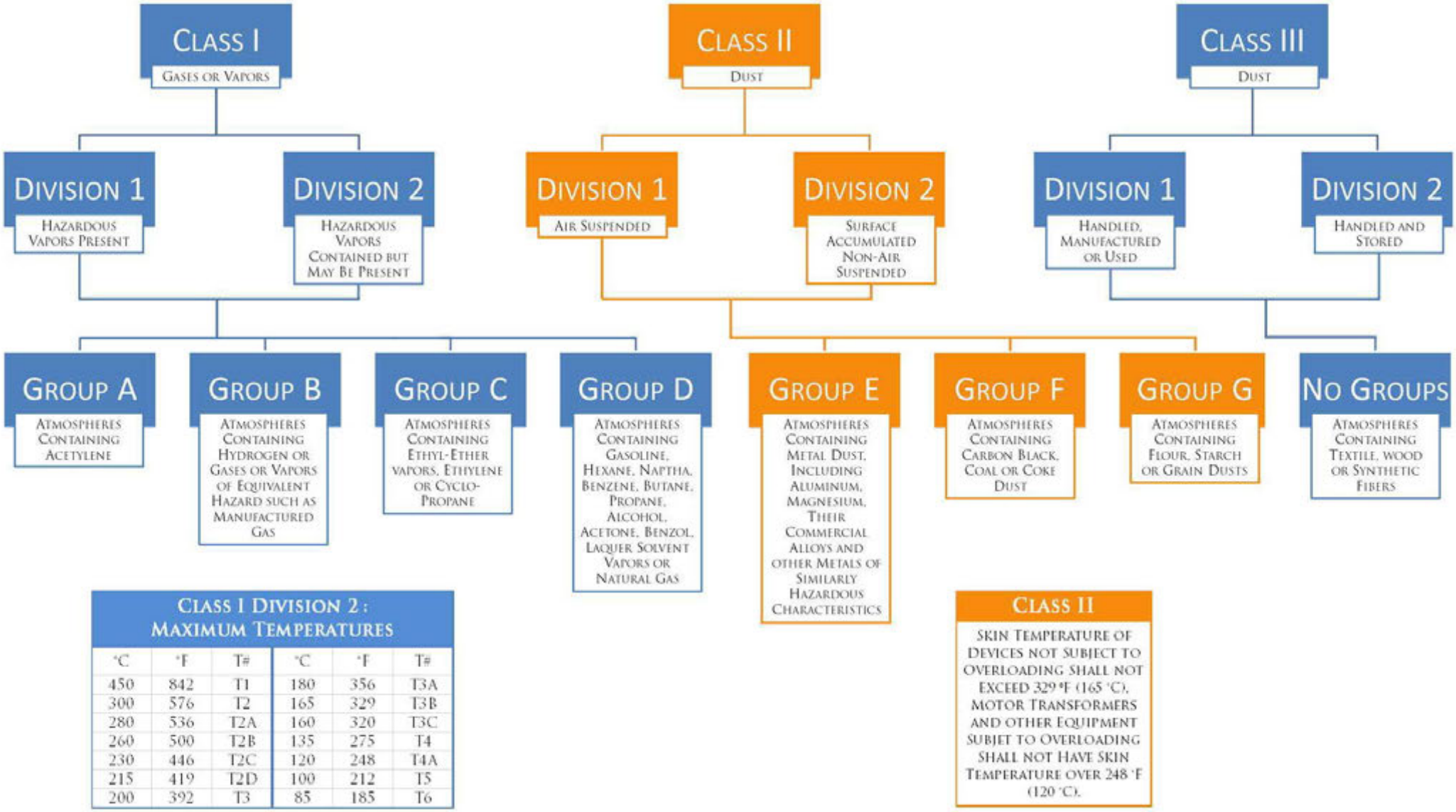
ICI's ThermoArmor thermal blanket can be fitted to all of our actuators for use in short duration high temperature applications where continued valve or damper automation is critical.

Motor Currents

FL = Full Load, LR = Lock Rotor

Model	115 Vac (Std.)		115 Vac Ext'ed		24 Vac		24 Vdc		12 Vdc		208 Vac/1Ph/60Hz		230 Vac/1Ph/60Hz		230 Vac/3Ph		460 Vac/3Ph	
	FL	LR	FL	LR	FL	LR	FL	LR	FL	LR	FL	LR	FL	LR	FL	LR	FL	LR
R	0.64	1.5	N/A	N/A	0.4	2.4	0.4	2.4	0.6	2.9	0.36	0.72	0.32	0.68	N/A	N/A	N/A	N/A
SR	0.38	0.75	0.38	0.75	0.7	3.2	0.7	3.2	1.3	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
SX	0.38	0.75	0.38	0.75	0.7	3.2	0.7	3.2	1.3	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
SD	0.38	0.75	0.38	0.75	0.7	3.2	0.7	3.2	1.3	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
SDX	0.38	0.75	0.38	0.75	0.7	3.2	0.7	3.2	1.3	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
MR	0.38	0.75	0.38	0.75	0.7	3.2	0.7	3.2	1.3	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
MS	0.38	0.75	0.38	0.75	0.9	3.2	0.9	3.2	1.7	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
ML	0.38	0.75	0.38	0.75	1.1	3.2	1.1	3.2	2.2	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
MH	0.38	0.75	0.38	0.75	1.1	3.2	1.1	3.2	2.2	4.2	0.21	0.42	0.18	0.38	N/A	N/A	N/A	N/A
LA	1.6	2.9	N/A	N/A	3.7	25	3.7	25	6.9	48	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
LX	1.6	2.9	N/A	N/A	5	25	5	25	10	48	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
5K	1.6	2.9	N/A	N/A	5	25	5	25	10	48	1.2	2.2	1.03	2	1.26	4.3	0.5	1.9
7K	1.6	2.9	N/A	N/A	5	25	5	25	10	48	1.2	2.2	1.03	2	1.26	4.3	0.5	1.9
12K	2.8	7.1	N/A	N/A	3.7	25	3.7	25	6.9	48	1.2	2.2	1.03	2	1.26	4.3	0.5	1.9
14K	2.8	7.1	N/A	N/A	14	-	14	-	-	-	1.2	2.2	1.03	2	1.26	4.3	0.5	1.9
19K	2.8	7.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.2	2.2	1.2	4	0.95	4	0.5	2.16
27K	2.8	7.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.2	2.2	1.2	4	0.95	4	0.5	2.16
AS2	1.6	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.03	2	N/A	N/A	N/A	N/A
AS4	1.6	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
AS6	1.6	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
AS10	1.6	2.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
ASC4	1.6	2.9	N/A	N/A	3.7	25	3.7	25	6.9	48	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
ASC6	1.6	2.9	N/A	N/A	3.7	25	3.7	25	6.9	48	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
ASC10	1.6	2.9	N/A	N/A	3.7	25	3.7	25	6.9	48	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
ASC12	1.2	-	N/A	N/A	5	25	5	25	10	48	1.2	2.2	1.03	2	N/A	N/A	N/A	N/A
SNS1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.34	2.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SNS2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.34	2.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SNS3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.34	2.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SNS4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.65	2.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SNS6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1.5	2.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SNS10	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.2	2.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SNS15	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	2.3	2.38	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Hazardous Classifications



Class I Division 2 : Maximum Temperatures

°C	°F	T#	°C	°F	T#
450	842	T1	180	356	T3A
300	576	T2	165	329	T3B
280	536	T2A	160	320	T3C
260	500	T2B	135	275	T4
230	446	T2C	120	248	T4A
215	419	T2D	100	212	T5
200	392	T3	85	185	T6

Class II

Skin Temperature of devices not subject to overloading shall not exceed 329 °F (165 °C). Motor transformers and other equipment subjet to overloading shall not have skin temperature over 248 °F (120 °C).

Duty Cycle

What Actuator Buyers Need to Know Now...

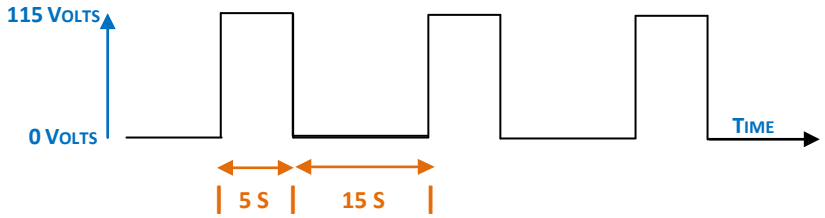
A good analogy for initially understanding duty cycle can start with the idea of riding a bicycle. You peddle (period of energy exertion) and then coast (period of rest) using your momentum to carry you forward. As you slow down (due to wind resistance, road friction, or road terrain) you peddle to speed up and then coast again.
The 'duty cycle' is the ratio of peddling time to the total time (peddle + coast time). A 100% duty cycle means you are capable of peddling all the time for the entire duration of the bike ride without getting tired. A 50% duty cycle means you are only capable of peddling for half the total bike ride because your endurance does not allow any more than that.
Because of the complexity of the Duty Cycle Calculations and the extensive engineering data per specific motor design and rating required for the calculations, it is necessary for the sales engineer to refer to the Product Department for motor sizing with a duty cycle application.
Duty cycle in the valve automation world is the ratio of actuation on time to off time and is used to determine the proper actuator for a specific application. Understanding duty cycle is necessary in order to determine an acceptable operating time so that the thermal over load in the motor is not exceeded during valve or damper automation. Actuator inefficiencies cause the motor temperature to rise. At a critical temperature the thermal overload protection is activated and the actuator is shut down. The actuator is inoperative (undesirable in most applications) for a period of time allowing the motor to cool and the thermal overload to reset.

Variables: Duty Cycle = D On Time= O Off Time = F

Equation: D = O / (O + F) x 100

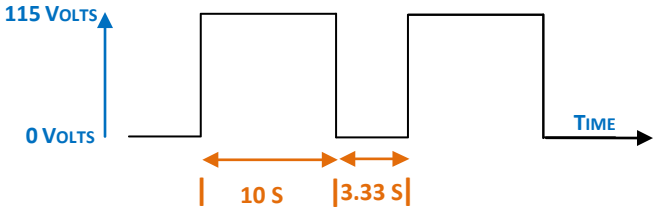
For example: ICI's standard SD model has a 5 second cycle time and is rated @ 25% Duty Cycle. This means that the off time must be at least 15 seconds, hence:

O = 5, F = 15
D = 5 / (5 + 15) x 100
D = 5 / 20 x 100
D = 0.25 x 100 = 25%



Model SD with an extended duty motor has a 10 second cycle time and is rated at 75% duty cycle. This means that the off time must be at least 3.333 seconds, hence:

O = 10, OFF = 3.333
D = 10 / (10 + 3.333) x 100
D = 10 / 3.333 x 100
D = 0.75 x 100 = 75%

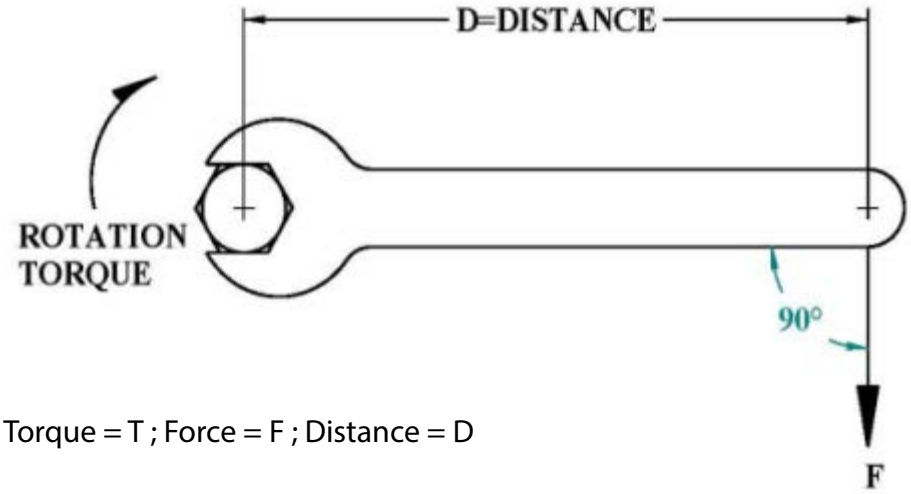


This formula can be used to determine the off time of an actuator if the cycle time and duty cycle are known.

F = O / D x 100 - O

What is Torque?

A force about a given axis that produces rotation has a moment (torque). The magnitude of the moment is the product of the force (F) and the perpendicular distance (D) from the line of action of the force to the axis, T=F x D. Simply put torque is generated by a twisting force which produces rotation about an axis.



Torque = T ; Force = F ; Distance = D

Ft-Lb	In-Lb	N-m
1	12	1.36
5	60	6.8
10	120	13.6
20	240	27.2
40	480	54.4
80	960	108.8
100	1,200	136
200	2,400	272
400	4,800	544
600	7,200	816
800	9,600	1,088
1,000	12,000	1,360

Ft-Lb x 12 = In-Lb ; Ft-Lb x 1.36 = N-m ; In-Lb x 0.113 = N-m

ISO 5211:2001(E) Mounting Dimensions

Flange Type	Female Drive	Bolt Circle
F03	9mm (.354" Sq.)	36mm (1.417")
F04	11mm (.433" Sq.)	42mm (1.654")
F03/F04 (Not an ISO Flange)	11mm (.433" Sq.)	36mm (1.417")
F05	14mm (.551" Sq.)	50mm (1.969")
F07	17mm (.669" Sq.)	70mm (2.756")
F10	22mm (.866" Sq.)	102mm (4.016")
F12	27mm (1.063" Sq.)	125mm (4.921")
F14	36mm (1.417" Sq.)	140mm (5.512")
F16	46mm (1.811" Sq.)	165mm (6.496")
F25	55mm (2.165" Sq.)	254mm (10.000")
F30	75mm (2.953" Sq.)	298mm (11.732")

The above dimensions were taken from the International Standard ISO 5211 First edition 2001-02-15 and are only a small representation of the information available in International Standard ISO 5211.

Reference Tools

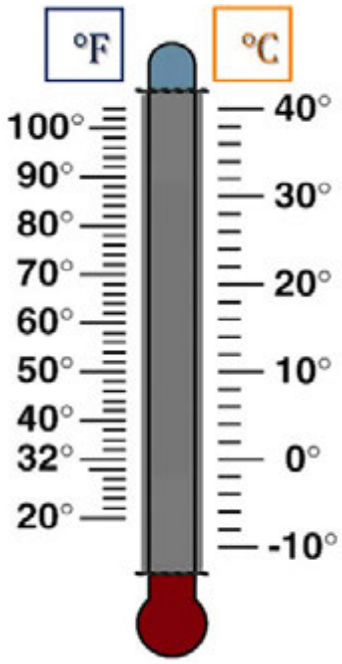
Powder Coating Specifications

The powder coating used on all ICI electric actuators

	Epoxy	Hybrid	Aromatic Urethane	Aliphatic Urethane	TGIC Polyester	Polyester Wrinkle	Non-TGIC Polyester
Hardness							
Flexibility							
Overbake Stability							
Exterior Durability							
Corrosion Protection							
Chemical/Solvent Resistance							
Ease of Application							

Not Good | Fair | Good | Very Good | Best

Temperature Conversion



$$°C = \frac{5 \cdot (°F - 32)}{9}$$

$$°F = °C \cdot \frac{9}{5} + 32$$

NEMA Enclosure Type Ratings

TYPE 1: General purpose intended for indoor use to prevent accidental contact with enclosed equipment.

TYPE 4: Water and dust tight intended for indoor or outdoor use to protect enclosed equipment from splashing water, seeping of, falling or hose directed water and severe external condensation.

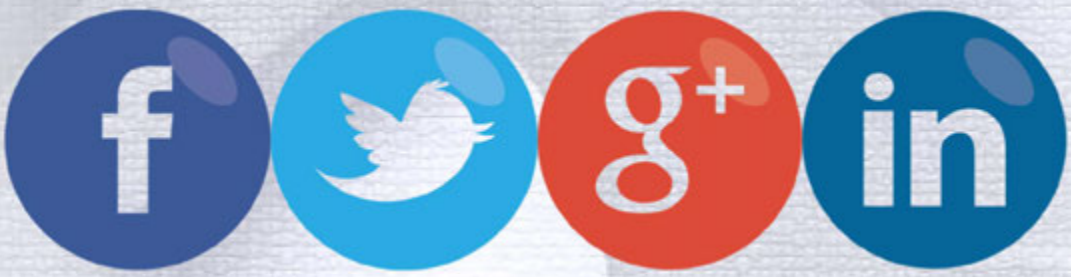
TYPE 4X: Water and dust tight with same provisions as Type 4 enclosure but also are corrosion resistant.

TYPE 6: Water and dust tight sleet resistant intended for indoor or outdoor use where occasional submersion may be encountered with a static head of no more than 6 feet for no longer than 30 minutes.

TYPE 7: Class I, Division 1 and 2, Groups A, B, C or D intended for indoor hazardous locations. Division 1: Hazardous vapors are present. Division 2: Hazardous contained but may not be present. Groups A, B, C & D classifies different gases and vapors.

TYPE 9 : Class II, Division 1 and 2, Groups E, F or G intended for indoor hazardous locations. Division 1: Air suspended dust. Division 2: Surface accumulated non-air suspended. Groups E, F & G classifies different dust types.

IP Code	Min. NEMA Rating
IP65	4,4X
IP67	6
IP68	6P



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