



Electric Actuator ITQ Series



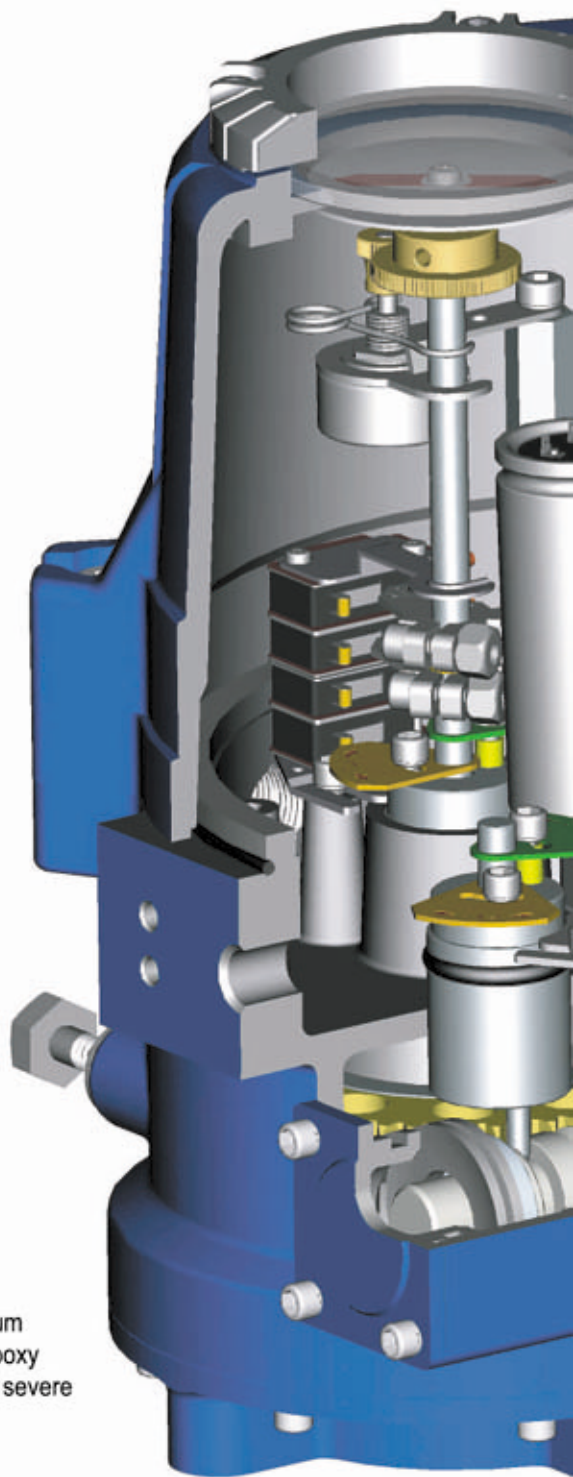
INTRODUCTION

- I-Tork controls designs, produces and provides high quality actuators and services related with valve automation.
- Our long years experience in automation field enables us to launch ITQ series electric actuator which has compact size, robust construction, reliable performance and ability to integrate fully into sophisticated control systems.
- I-Tork controls is always ready for you to provide qualified service with its ITQ series actuator and accessories.

FEATURES

- Compact and robust construction, light weight providing high output torque (Max3000Nm).
- Wide range torque variation (From min 60Nm to max 3000Nm).
- Hard anodized aluminum housing inside and outside with external powder coated against severe industrial environment.
- Enclosure using radial seals & O-rings that provide protection to waterproof IP67 (Nema 4 & 4X) and optional watertight IP68
- Mounting base according to ISO5211 standard.
- Removable drive bushing for easy machining and installation.
- Self-locking provided by double worm gearing (no brake required).
- Auto-declutching manual override handwheel with padlockable auto / manual switchable lever.
- Reliable Mechanical Torque sensing system providing safe operation in overload condition.
- Large size window and indicator provide better position indication from a distance.
- Various Local position control options providing easy commissioning and operation in field.
- Digitalized control component.

Construction



Housing

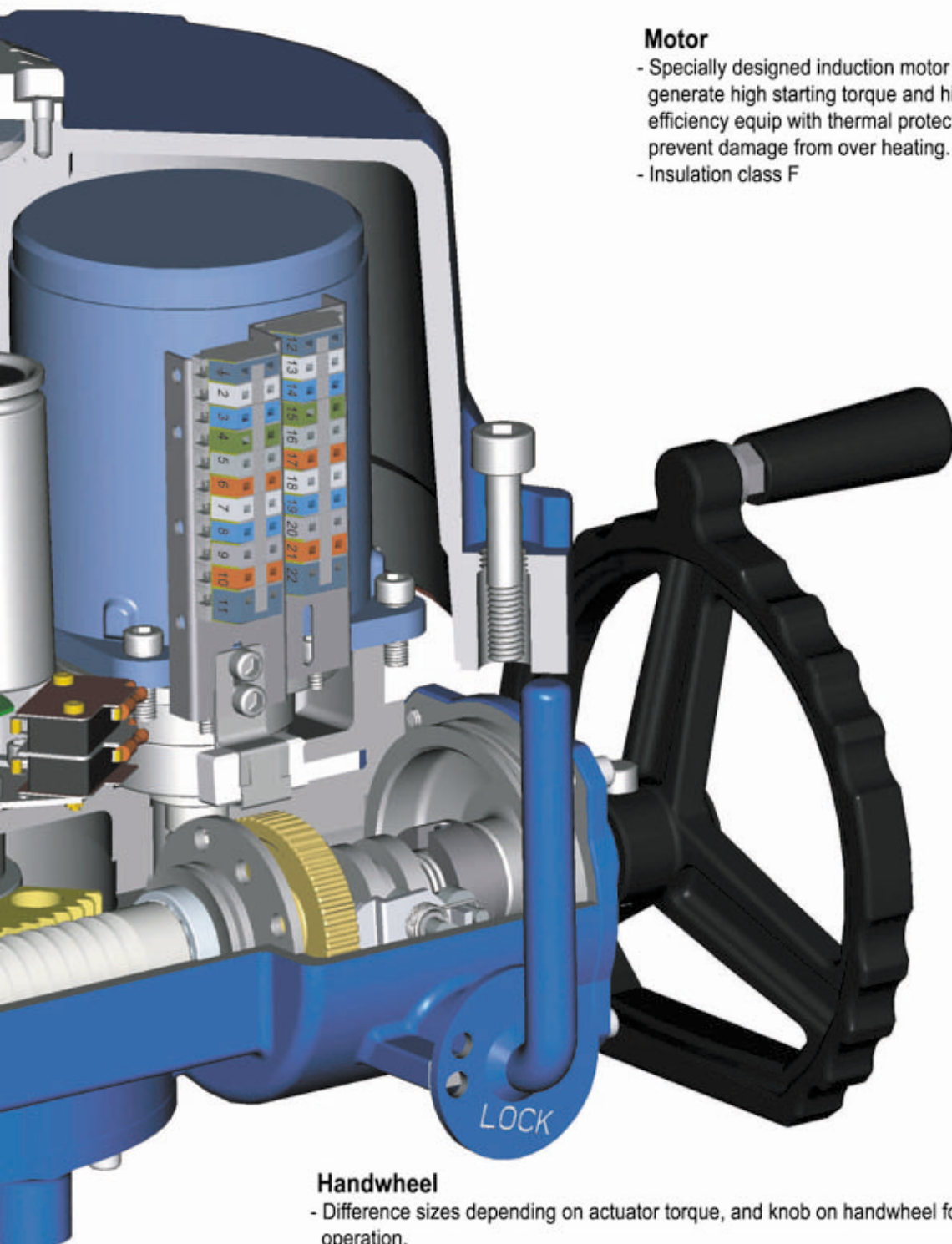
- Hard anodized Aluminum casting and external epoxy powder coated against severe industrial environment.

Sealing

- Sealed by O-ring in all interfaces, and double o-ring sealing for IP68 (option)

Lubrication

- EP type grease, maintenance free service for a long period of time.



Motor

- Specially designed induction motor to generate high starting torque and high efficiency equip with thermal protector to prevent damage from over heating.
- Insulation class F

Handwheel

- Difference sizes depending on actuator torque, and knob on handwheel for easy operation.

Gear

- Precisely machined double worm gear c/w minimum back-lash, low noise, high output torque.

Self locking

- Provided by double worm gearing to keep position of valve unchanged against reverse torque from valve.

ITQ ELECTRIC ACTUATOR

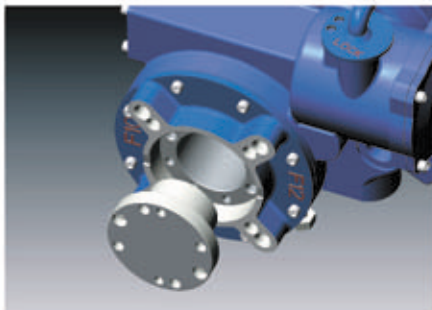


External mechanical stopper

- To prevent over run of travel angle when limit switch fails.

Cable entries

- Standard 2 X PF3/4"(Max 1") cable entry for various cable gland.



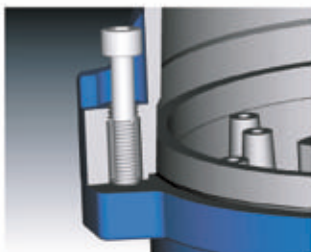
Removable drive bushing and ISO5211 mounting base

- Easy machining for step adaption.
- Standard ISO5211 mounting base (F03~F16) for easy mounting on valve.
- Large size drive bushing accept large valve stem.

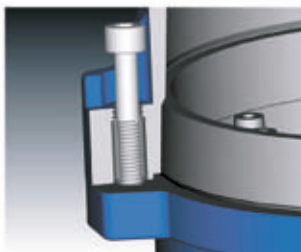


Space Heater

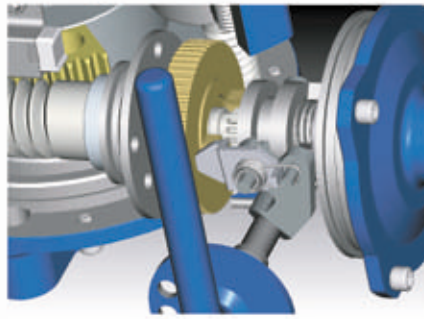
- Anti-condensation equip with thermal protector.



Standard short

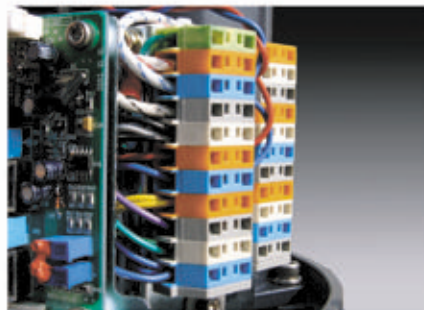


Optional long (Explosion proof)



Manual override

- Auto / Manual switchable lever and handwheel engagement for emergency manual operation.
- Drive force automatically resorted by motor start unless lever padlock to prevent it.



Terminal block

- Spring loaded push type terminal block provides tight wiring connection under severe vibration.

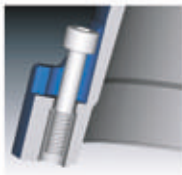
Wiring

- Standardized wiring and easy modification depending on application in field.



Tapered interface between cover and lower housing

- Thanks to tapered interface between mounting faces, easy lifting cover up from lower housing for wiring or maintenance.
- Two type of mounting face of lower housing provided.
 - Standard: Short interface for providing easier access to internal component
 - Explosion proof : Long interface for keeping the length of flame path



Captive cover bolt

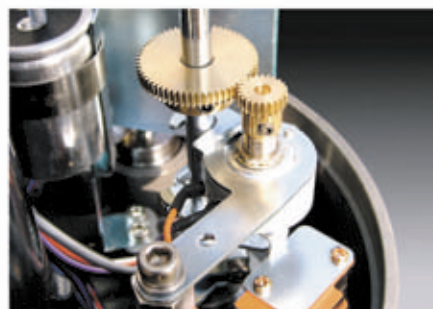
- Cover bolts are captive type designed to prevent losing it during maintenance or installation.

* All external bolts are stainless steel for rust prevention.



Torque switches (Open/Close)

- To protect actuator from damage caused by overload from the driven valve over the whole travel.



Potentiometer kit(PK)

- High resolution potentiometer and precisely machined gearing are directly engaged with drive shaft to feedback continuous position of valve



Limit switches

- Directly engaged with driving shaft to set accurate position of valve.
- 2 ea for each travel end (open/close).
- Optional Extra Limit Switches (Max 4 ea for each end)

Indicator position with arrow supported by spring

- Large size position indicator directly engaged with driving shaft for better visibility from a distance.
- Spring loaded underneath keeps set position unchanged unless user move it.



Technical Information

Model	Rated torque	Operating time 50/60Hz	Max bore size	Power consumption	Motor insulation class	Rated current(A) 50/60Hz				No of handle turns	Weight
						1 Phase		3 Phase			
	Nm	90°	mm	Watts		110V	220V	380V	440V	90°	Kg

Small ITQ

ITQ 0060	60	22/18	14	15	F	0.5	0.3	NA	NA	9	3
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Regular ITQ

ITQ 0100	100	21/18	23	15	F	0.95/1.05	0.50/0.55	N / A	N / A	10	7
ITQ 0160	160	26/22	27	40	F	1.60/1.70	0.85/0.90	0.30/0.30	0.30/0.32	12	15
ITQ 0240	240	26/22	27	40	F	1.62/1.72	0.87/0.92	0.32/0.32	0.32/0.34	12	15
ITQ 0350	350	31/26	42	40	F	1.72/1.80	0.92/0.95	0.32/0.32	0.32/0.35	14	20
ITQ 0500	500	31/26	42	90	F	3.60/3.90	1.50/1.60	0.52/0.56	0.55/0.58	14	20
ITQ 0800	800	39/32	52	180	F	3.80/4.20	2.05/2.20	0.82/0.88	0.82/0.85	17	25
ITQ 1100	1100	39/32	52	180	F	3.90/4.30	2.15/2.30	0.84/0.90	0.84/0.88	17	25

Regular ITQ with Gear Box

ITQ 1500 (ITQ0500+ITG1/3)	1500	93/78	78	180	F	3.60/3.90	1.50/1.60	0.52/0.56	0.55/0.58	42	65
ITQ 2000 (ITQ0800+ITG1/3)	2000	117/97	78	180	F	3.80/4.20	2.05/2.20	0.82/0.88	0.82/0.85	52	70
ITQ 3000 (ITQ1100+ITG1/3)	3000	117/97	78	180	F	3.90/4.30	2.15/2.30	0.84/0.90	0.84/0.88	52	70

Standard specification

Enclosure	Weatherproof IP67, NEMA4 and 4X, O-ring sealed (ITQ 0060 IP66)
Main Power supply	110/220VAC/1Ph/50/60Hz, 380/440/VAC/3Ph/50/60/Hz $\pm 10\%$
Control power supply	110/220VAC/1Ph/50/60Hz $\pm 10\%$
Duty cycle(on-off)	S2, 20~50% Max 10Min~30Min
Duty cycle(modulating)	S4, 30~50%, 300~1200 start/Hour
Motor	Squirrel Caged induction motor
Limit switches	2 each for Open and Close (SPDT 250VAC/10A rating except for ITQ 0060)
Torque switches	1 each for Open and Close (SPDT 250VAC/10A rating except for ITQ 0060, 0100)
Stall protection / set temperature	Built in Thermal protection, High $150^{\circ}\text{C} \pm 5^{\circ}\text{C}$, Low $97^{\circ}\text{C} \pm 15^{\circ}\text{C}$
Travel angle	$90^{\circ} \pm 5^{\circ}$ ($0^{\circ} \sim 100^{\circ}$)
Position indicator	Plate with indication Arrow
Manual override	De-clutchable (except for ITQ 0060)
Self locking	Provided by double worm gearing (no brake) (except for ITQ 0060)
Mechanical stopper	1 each for each travel end (Open and Close), external & adjustable (except for ITQ 0060)
Heater	5W(110/220VAC) for anti-condensation
Cable entries	2 X PF 3/4" TAP (except for ITQ 0060 2 X PT 1/2 TAP)
Lubrication	EP type grease
Terminal block	Screw and Lever Push type (spring loaded)
Ambient temperature	$-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$
Ambient humidity	90%RH Max (Non-Condensing)
Anti vibration	XYZ 10g, 02~34Hz, 30 minutes
External coating	Dry power (Polyester)

Option availability

Mechanical

Symbol	Description	Remark
EX	Explosion proof (Ex d II B(C) T4)	Except for ITQ 0060
WT	Watertight (IP68)	Except for ITQ 0060
ALS	Auxiliary limit switches (Max 4 for each travel end)	Except for ITQ 0060, 0100 c/w option
ATS	Auxiliary torque switches (Max 4 for each travel end)	Except for ITQ 0060, 0100
EXT	Extended travel angle (upto 120°, 135°, 180°, 270°,)	Except for ITQ with Gear box
SV	Variation in torque and operating speed	Please consult before order

Remote monitoring and control

PK	Potentiometer kit (1 Kohm)	
CT	Current transmitter (output : 4-20mA DC)	
RPC	Remote position controller (by input and output signal)	Refer to below signal configuration
RPD	Remote position controller (by input and output signal) with display (LCD)	
Signal configuration	Input : 4-20mA, 0-10VDC, 2~10VDC, 1~5VDC, 0~5VDC	
	Output : 4-20mA, 0-10VDC, 2~10VDC, 1~5VDC, 0~5VDC	

Local monitoring and control

LP 2	Local position control (Remote / Local, Open / Stop / Close with lamps)
LM1	Integrated motor starter without local control switches (On-Off only)
LM2	Local position control (Remote / Local, Open / Stop / Close with lamps) with integrated motor starter (Mechanical)
LD	Local position control ((Remote / Local / Open / Stop / Close with lamps) with integrated motor starter, monitoring relays

Local Position controller LP2

- 1) Type : Rotary switches with position lamps
- 2) Operating
 - Selector switch : Remote (with Yellow lamp), Local (with Red lamps)
 - Control switch : Open/Stop/ Close
 - Local display : Green lamp at open position, Red lamp at close position



LP2

LM1 for 3 phase actuator

- Integrated 2 magnetic contactors for open and close without control device.

LM2 for 3 phase actuator

- 1) Type : Rotary switches with position lamps
- 2) Operating
 - Selector switch : Remote (with Yellow lamp), Local (with Red lamp)
 - Control switch : Open/Stop/ Close
 - Integrated 2 magnetic contactors for Open/Close, Power source for control
- 3) Options for remote monitoring and control
 - PK (0~1Kohm), CT (4-20mA output signal), RPC (or RPD) for 4-20mA input/output signal



LM2

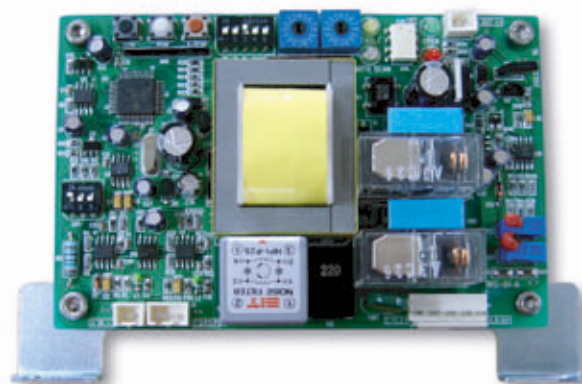
ITQ ELECTRIC ACTUATOR

RPC

- A combination of electronic positioner(4-20mA input, proportional control) and transmitter(4-20mA continuous output signal)
- Auto-calibration provides the most convenient to user without complicated set in field

LD

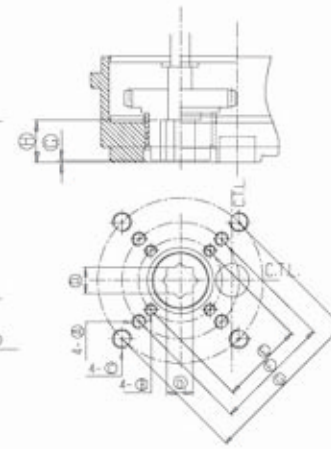
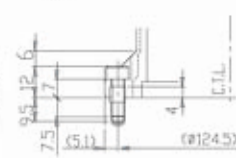
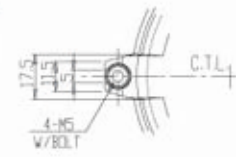
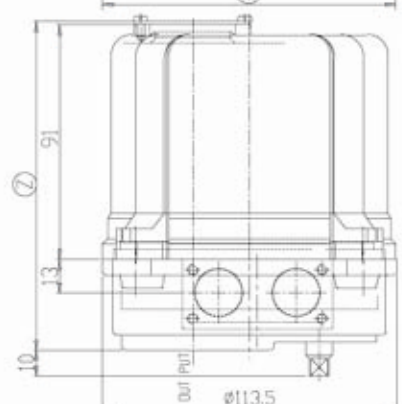
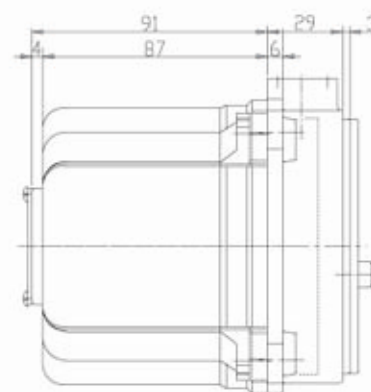
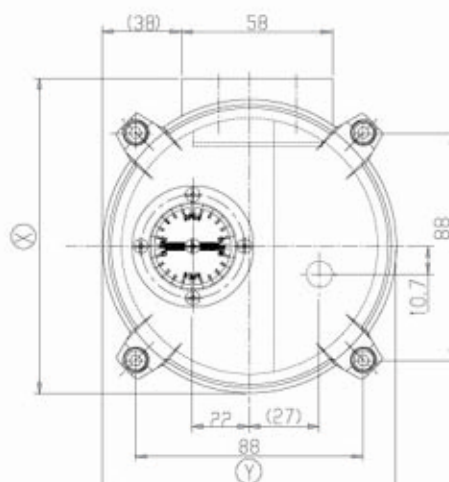
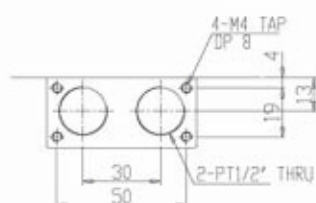
- 1) Type : 2 Magnetic sensors(Rotary type) with status monitoring lamps
 - Operating : Selector switch - Off, Local, Remote(Off: Stop or turn off)
 - Control switch-Local open, Close
- 2) Local display : Remote / Local, open, close, over torque
- 3) Remote control : Type : 5000V Opto-Isolated, DC24V, AC110 both
 - Command : Open/Close/Stop/ESD(Emergency shut down)
 - Output : Relay and direct from switch(Full open/full Close)
- 4) Options
 - CT(Current transmitter) : Both sink/Source type, output 4-20mA
 - RPC(or RPD) for 4-20mA input and output signal
 - Profibus communication : 1.5Mbps, 1 channel, SPC-3



Dimensions

Small ITQ

TYPE	ITQ 0060
FLANGE	F03/F05/F07
(ISO 5211)	
A	M5 X 8
B	M6 X 8
D	Ø14
E	35
F	50
G	70
H	1
I	16.5
X	121.8
Y	Ø113.5
Z	129



Double square female drive shaft

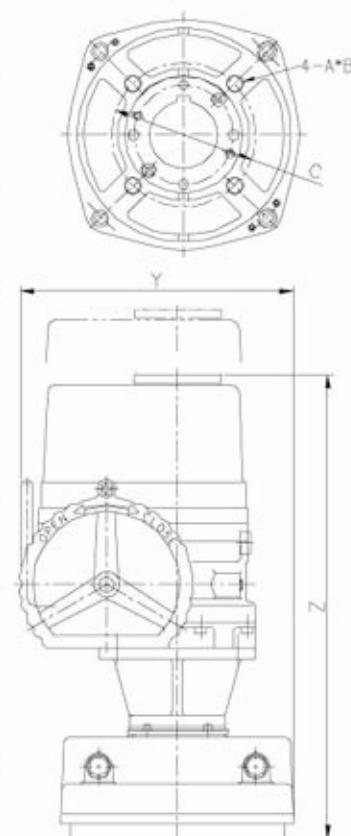
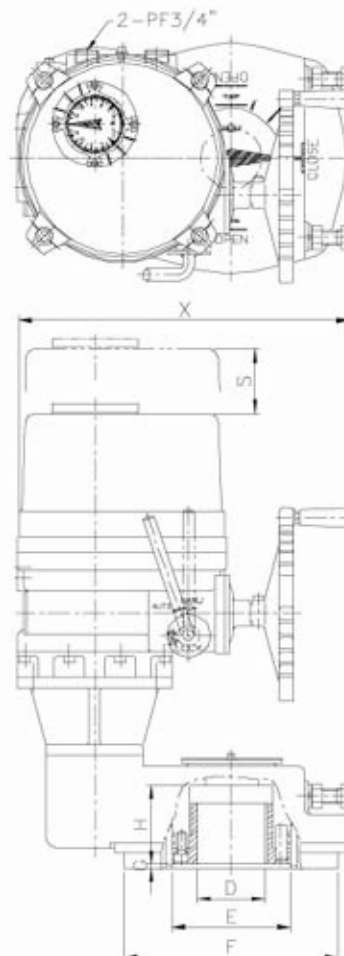
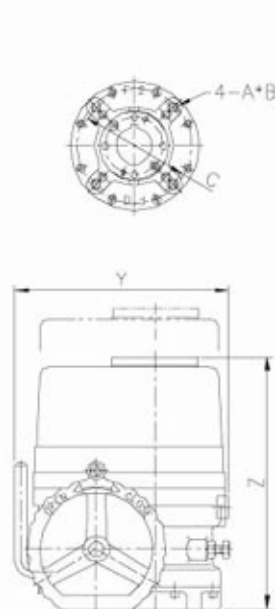
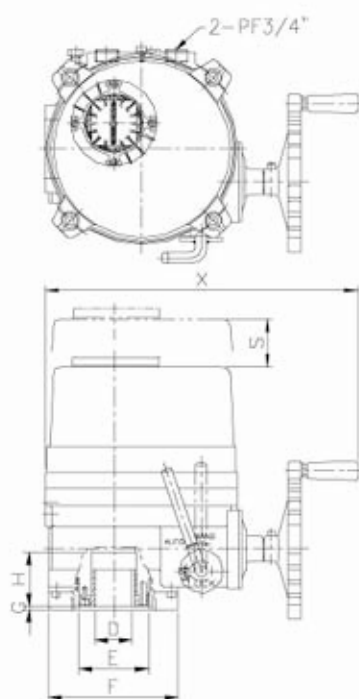
Dimensions

Regular ITQ

	(mm)						
TYPE	ITQ 0100	ITQ 0160	ITQ 0240	ITQ 0350	ITQ 0500	ITQ 0800	ITQ 1100
FLANGE	F07	F07	F07	F10	F10	F12	F12
ISO5211		F10	F10	F12	F12	F14	F14
C	∅ 70	∅ 70 ∅ 102	∅ 70 ∅ 102	∅ 102 ∅ 125	∅ 102 ∅ 125	∅ 125 ∅ 140	∅ 125 ∅ 140
A	M8	M8/M10	M8/M10	M10/M12	M10/M12	M12/M14	M12/M14
B	14	14 / 17	14 / 17	17 / 21	17 / 21	20/25	20/25
D (Key)	∅ 22	∅ 25	∅ 25	∅ 40	∅ 40	∅ 48	∅ 48
D (Squ.)	□ 20	□ 23	□ 23	□ 34	□ 34	□ 40	□ 40
E	∅ 50	∅ 58.5	∅ 58.5	∅ 80	∅ 80	∅ 95	∅ 95
F	∅ 88	∅ 125	∅ 125	∅ 148	∅ 148	∅ 178	∅ 178
G	3	3	3	3	3	3	3
H	37	57	57	62	62	67	67
S	100	115	115	145	145	170	170
X	258	338	338	357	357	380	380
Y	172	229	229	244	244	284	284
Z	220	259	259	288	288	313	313

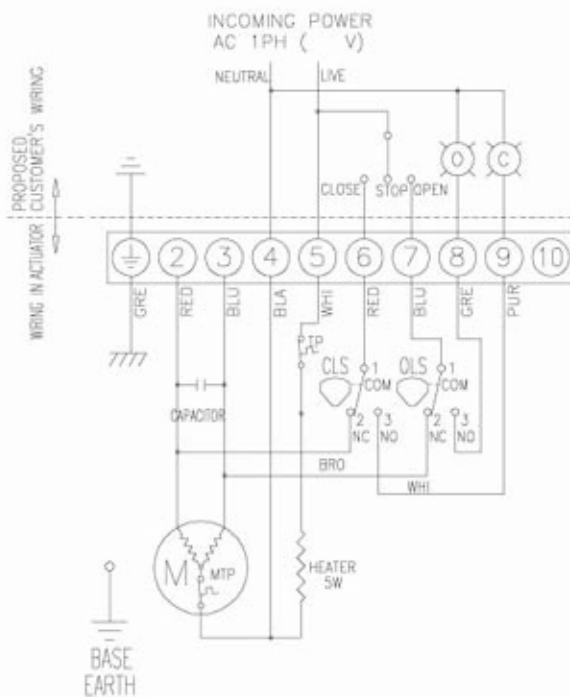
ITQ with Gear Box

	(mm)		
	ITQ 1500	ITQ 2000	ITQ 3000
	F16	F16	F16
	∅ 165	∅ 165	∅ 165
	M20	M20	M20
	32	32	32
	∅ 75	∅ 75	∅ 75
	□ 64	□ 64	□ 64
	∅ 135	∅ 135	∅ 135
	∅ 245	∅ 245	∅ 245
	5	5	5
	90	90	90
	145	145	145
	357	357	357
	293	293	293
	506	506	506

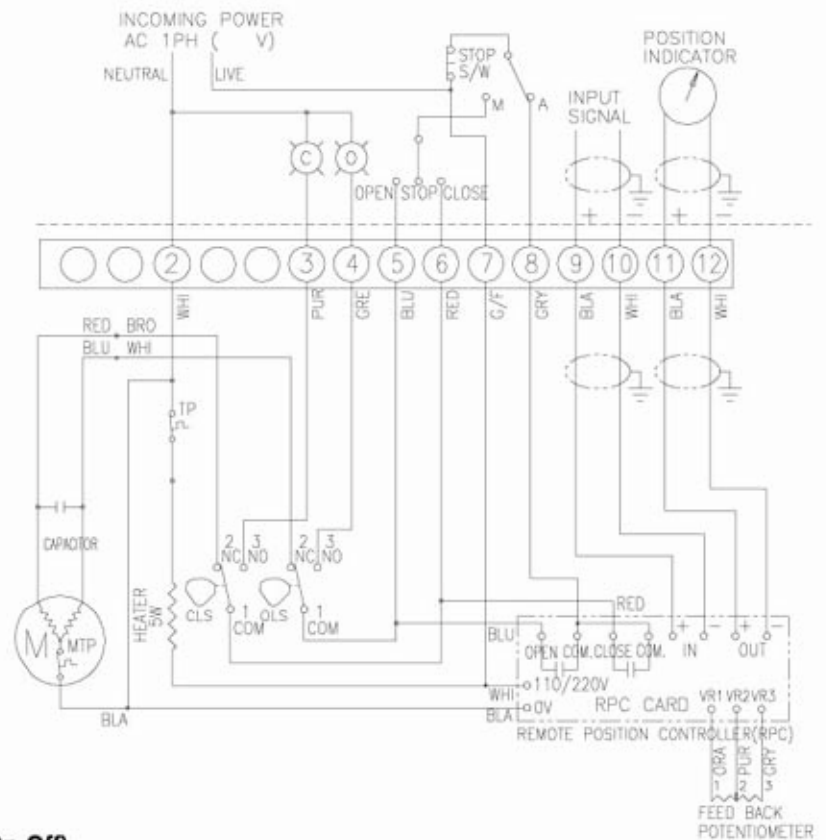


Typical Wiring

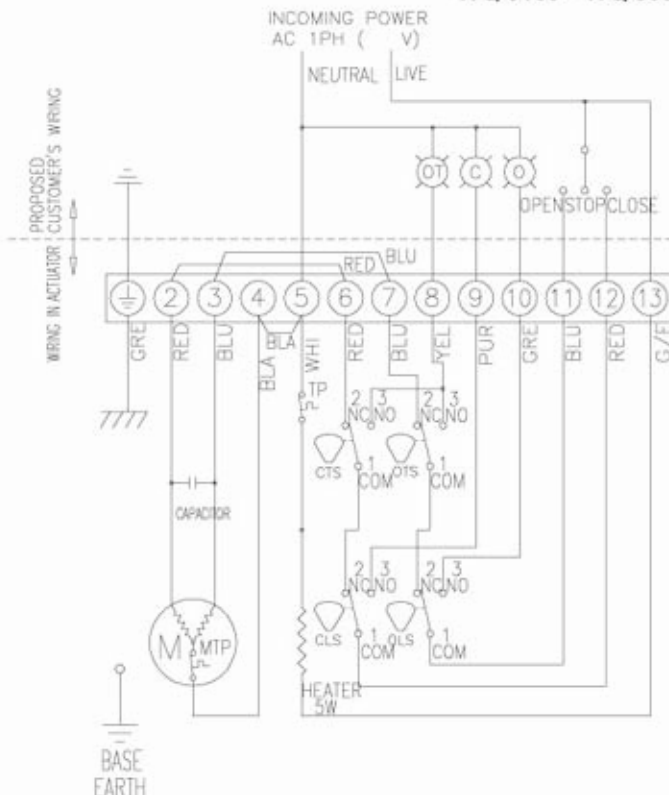
110/220VAC/50/60Hz, 1Ph(On-Off)
ITQ 0100



110/220VAC/50/60Hz, 1Ph(Modulating : RPC)
ITQ 0100



110/220VAC/50/60Hz, 1Ph(On-Off)
ITQ 0160 ~ ITQ 3000



ALS : Auxiliary Limit switch

AOLS : Auxiliary Open Limit switch (Dry contact)

ACLS : Auxiliary Close Limit switch (Dry contact)

O : Open lamp

C : Close lamp

OT : Over torque lamp

CLS : Close limit switch (250VAC 10A)

OLS : Open limit switch (250VAC 10A)

CTS : Close torque switch (250VAC 10A)

OTS : Open torque switch (250VAC 10A)

CC : Close magnetic coil

OC : Open magnetic coil

M : Motor

TP : Thermal protector (250VAC 115A option)

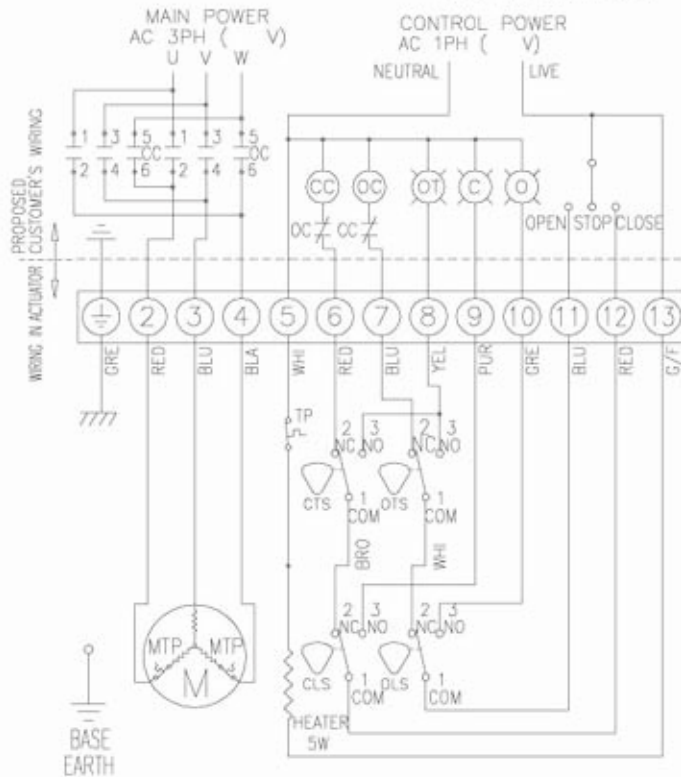
MTP : Thermal protector built in motor

* Each actuator should be powered through its own individual switch or relay contacts to prevent cross feed between two or more actuators.

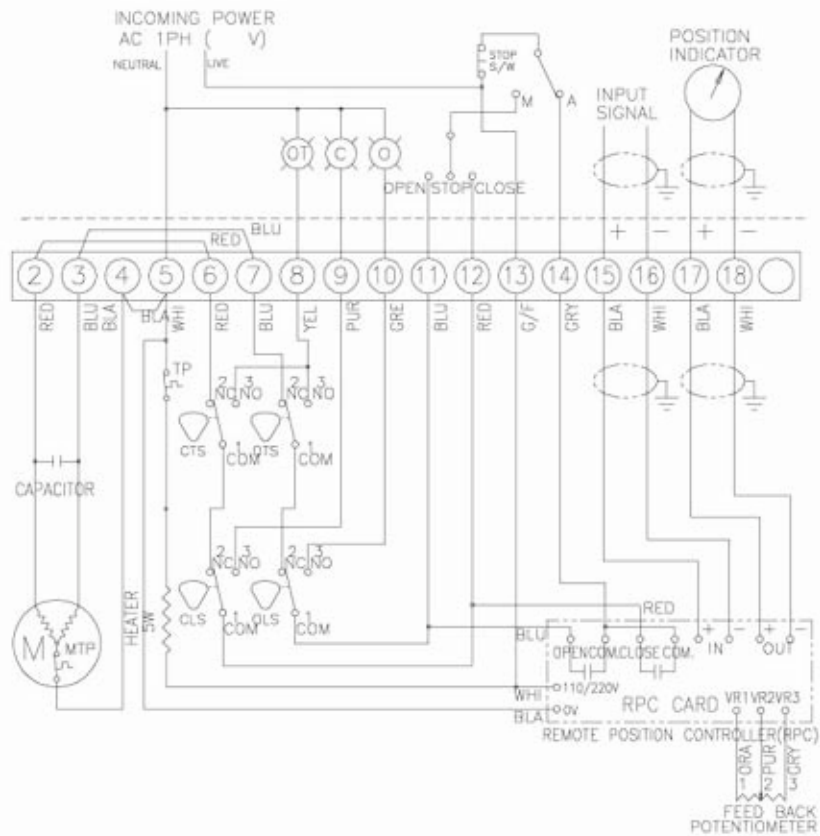
* In case of 3ph actuator, make sure to place actuator on middle of travel angle before electrical operation to avoid "Jamming"

* All internal wiring is done as color coding.

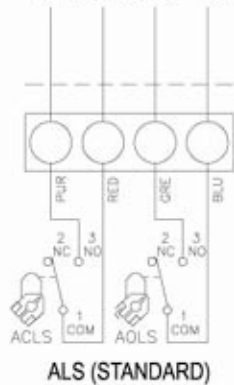
380/440VAC/50/60Hz, 3Ph(On-Off)
ITQ 0160 ~ITQ 3000



110/220VAC/50/60Hz, 1Ph(Modulating : RPC)
ITQ 0160 ~ ITQ 3000

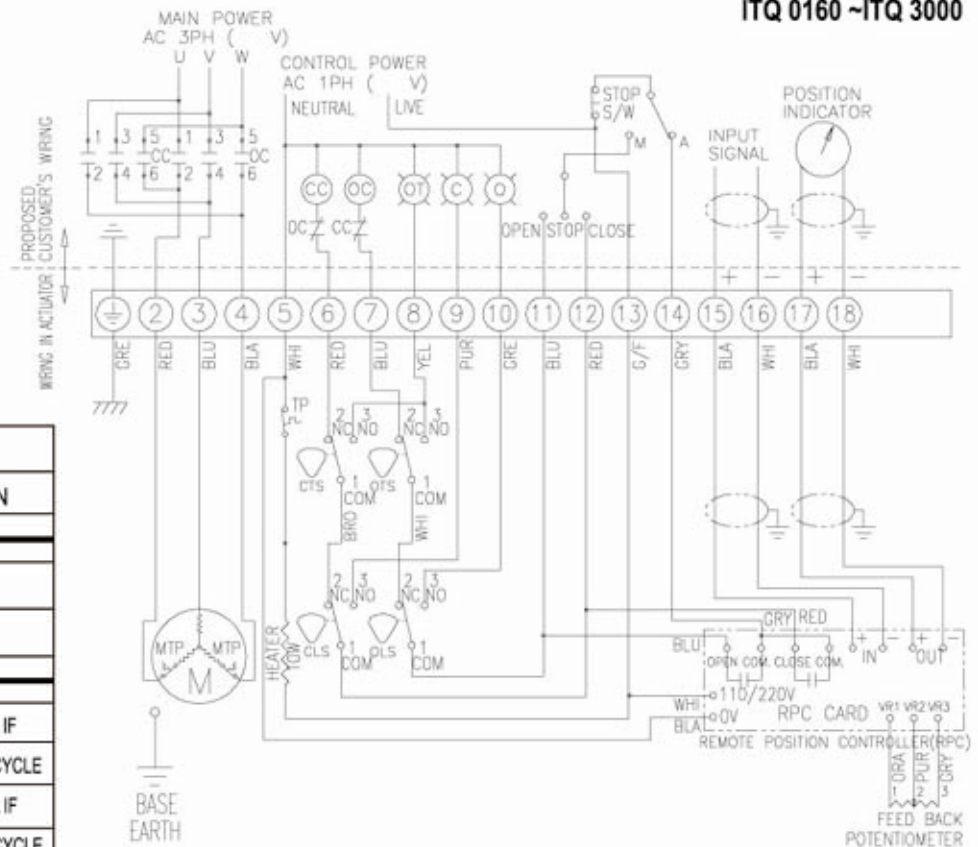


AUX. CONTACT
MAX. 250VAC 10A



ALS (STANDARD)

380/440VAC/50/60Hz, 3Ph(Modulating : RPC)
ITQ 0160 ~ITQ 3000



TORQUE AND LIMIT SWITCHES OPERATION			
SWITCH	CLOSE	INTERMEDIATE	OPEN
CLS 1-2			
CLS 1-3			
OLS 1-2			
OLS 1-3			
CTS 1-3	* CLOSING TORQUE SWITCH INTERRUPTS CONTROL IF MECHANICAL OVERLOAD OCCURS DURING CLOSING CYCLE		
OTS 1-3	* OPENING TORQUE SWITCH INTERRUPTS CONTROL IF MECHANICAL OVERLOAD OCCURS DURING OPENING CYCLE		

ITQ Electric Actuator Standard selection guide for valves

VALVE ACTUATOR	BUTTERFLY VALVE 10K ANSI 150#	BUTTERFLY VALVE 20K ANSI 300#	2-WAY BALL VALVE 10K ANSI 150#	2-WAY BALL VALVE 20K ANSI 300#	3-WAY BALL VALVE 10K ANSI 150#
ITQ 0060	80A (3")	65A (2 1/2")	32A (1 1/4")	25A (1")	25A (1")
ITQ 0100	100A (4")	80A (3")	50A (2")	40A (1 1/2")	40A (1 1/2")
ITQ 0160	125A (5")	100A (4")	65 / 80A (1 1/2" / 3")	50A (2")	50A (2")
ITQ 0240	150A (6")	125A (5")	100A (4")	65 / 80A (2 1/2" / 3")	65 / 80A (2 1/2" / 3")
ITQ 0350	200A (8")	150A (6")	150A (6")		
ITQ 0500	250A (12")				100A (4")
ITQ 0800	350A (14")	250A (10")	200A (8")	125A (5")	125A (5")
ITQ 1100	400A (16")	300A (12")		150A (6")	150A (6")
ITQ 1500	450A (18")	350A (14")	250A (10")		
ITQ 2000	500A (20")	400A (16")	300 / 350A (12" / 14")	200A (8")	200A (8")
ITQ 3000	600A (24")	450 / 500A (18" / 20")		250 / 300A (10" / 12")	250 / 300A (10" / 12")

* Above table is just a reference without I-TORK's responsibility.



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