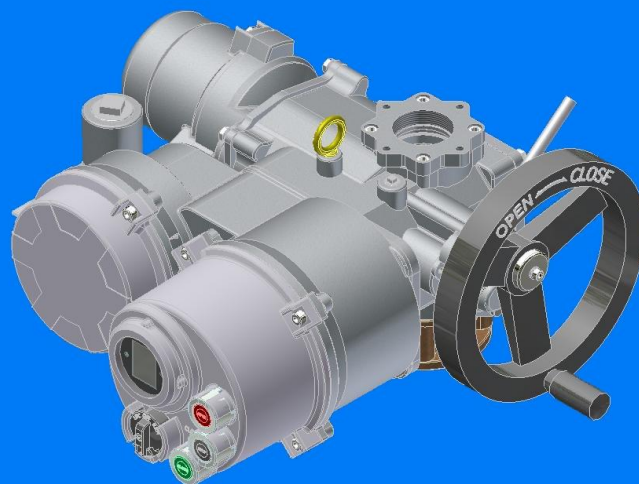


# TMe SERIES

Intelligent Multi turn Valve Actuator



0 %  
全閉位置  
29Nm 012165

18 %  
設定功能  
29Nm 012165

⚠ 56 %  
扭距跳脫  
29Nm 012165



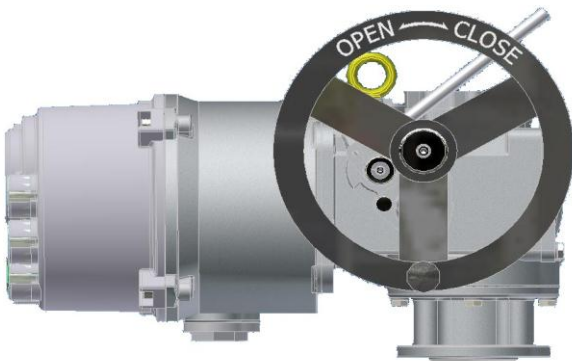
## Preface

Since the SEIBU ELECTRIC & MACHINERY CO., LTD was incorporated to engage the valve operating machine, some 550,000 units of machines have been manufactured over the past 51 years. During the said period, our valves, gates and throttles became highly regarded by customers considering their excellent performance in the field of tap water plants, sewage water treatment plants, power generation and relevant production equipments in Japan. In the meantime, we have promoted our industrial activities according to the philosophy of CBS - "Cooperate - Think from the position of customers. Build up - Provide perfect product and system. Service - Satisfy customers". In the future, this company will try its best to use "the customer mind" as the "SEIBU ELECTRIC & MACHINERY CO., LTD mind" in the hopes of creating more perfect products to satisfy customer demands and contribute to the development of society ◦

**TMe Electric multi turn Actuator Retention**  
the original TM series tradition ◦ Increases the more powerful electronic wisdom to fulfill the requirement of customer demand ◦

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## FEATURE

Perfect Protection (Water protection/explosion proof)

Elimination of water-caused breakdowns through double sealing of terminal section and achieving protection standard IP68 (6 meter 48Hours) ◦ Protection of the actuator operating in hazardous area through explosion proof feature(Exd II BT-4) ◦ All the compartments of TMe series are double sealed with a pair of V shape ring & O ring and have enough flame path according to IEC standard to ensure complete protection from dust , moisture ,and flame ◦

Multi-unit configuration

All the compartment are independent of each other, but simple to assemble or disassemble, thus the expansion of function is easy ◦



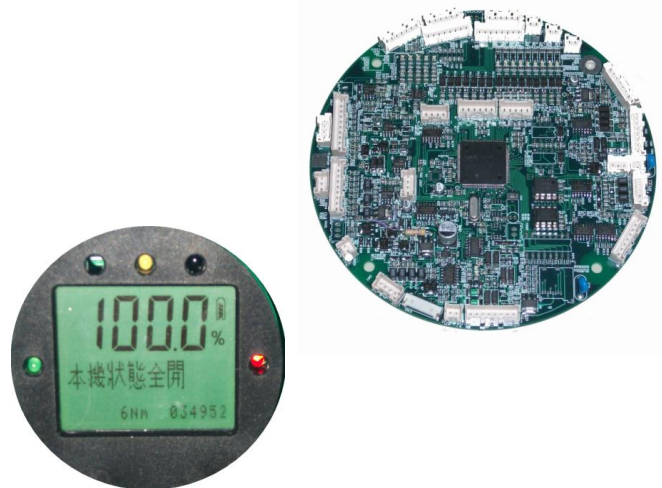
**Furnished with Simple & Standard chips circuits** - By use of 16 bit CPU as the conformity systems control and photo coupler as the signal transmission to enhance the stability ,Surge absorber join on power circuit PCB ◦

### Inverter Drive

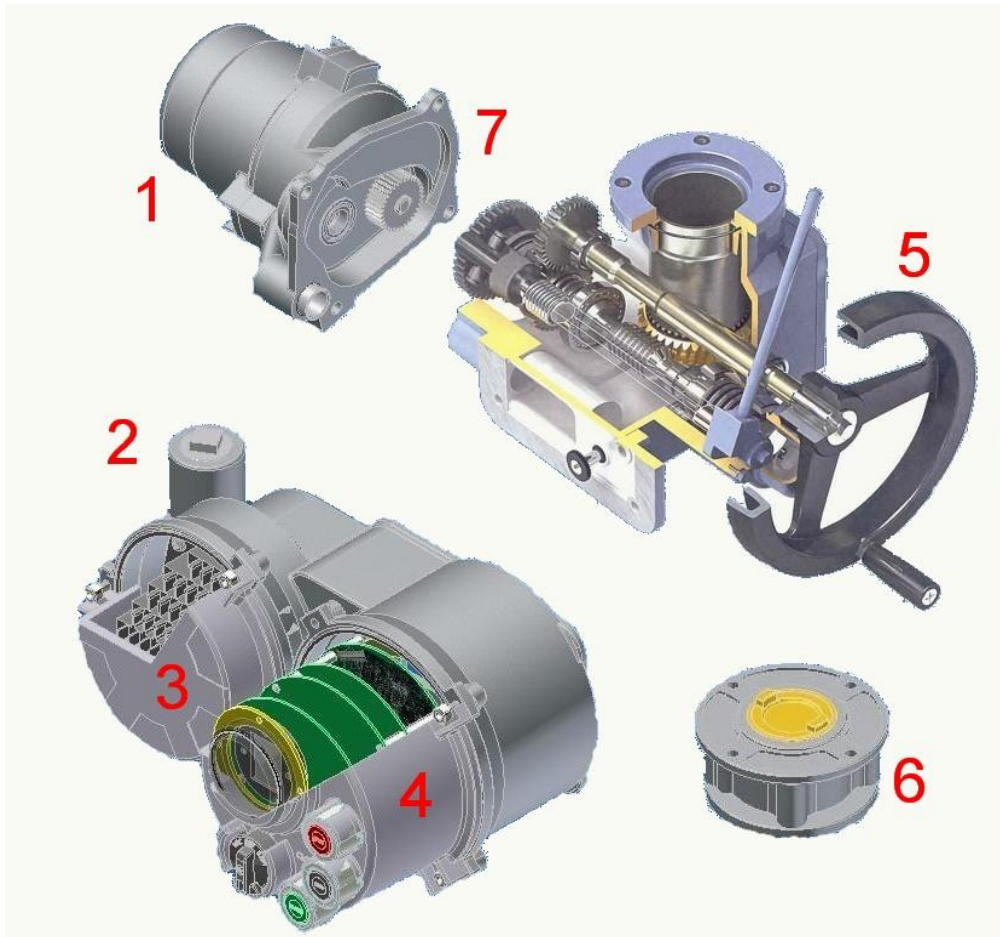
Opening and closing speed can be adjustable with install of an Inverter ◦ (Option)

### Independent Hand wheel shaft - all side mounted

All TMe series actuators have "independent Hand wheel shaft" engaged with the worm through an intermediate spur gear to prevent the manual drive parts from the damages often occur in the manual drive parts during the manual operation of the actuators of which hand wheel shaft directly drive the worm. Also .the side mounted hand wheel. All of gear set immersion in grease oil and runs long periods ◦



## Construction



### 1. Motor and Power Transmission System

The low-inertial/high-torque motor is used to achieve the maximum torque after Hand wheel s thus, exhibiting very little overrun after being issued a stop command. By using optional frequency-change specifications, the Local Operation Switch can be used to change the opening/closing speed without disassembly or replacement of parts. Because the Thermostat mounted on the ambient temperature will not affect the Motor Coil and the motor temperature can be directly detected, it can easily demonstrate the designed function effectively until reaching the upper temperature limit. Further, a jammed valve body can also be pulled out easily using the Hammer Blow effect during start up ◦

### 2. Chargeable battery Set

To memorize actuator current position and message LCD display when power is failure ◦

### 3. Terminal Unit

An independently sealed construction for the Terminal Board is provided. Even if the Terminal Box cover is opened for wire connection, the internal electronic parts will not be exposed to the external atmosphere (Double Sealed).

#### 3.1 Terminal Block

Control : 47 Points with M4 screw .rateing AC250V 5A ◦

Power : 3 Points with M6 screw. rateing AC660V 63A ◦

Earth : 1Point with M6 screw.

## 4. Non-Through Switch Control Unit

All actuator settings and diagnostics are made through the sealed indication window. It is not necessary to remove electrical covers to expose the integral controls on site. Internal all parts receive the double seal the water-repellent envelope protection, promoted the operation machine to be possible the faith. The interior inclusion Printed control circuits board. Torque Detection unit. position detection unit. single input/output unit. message display unit. remote control unit. motor reversible contact switch.

**4.1 Printed control circuits board:** All control function even conformity is consuming energy lowly in the mono crystal chip intelligence microprocessor. Used the multilayer printed-circuit board electric circuit to enhance the anti-miscellaneous news effect greatly, increased the control the stability.

**4.2 Actuator Local Operation Switch** The Local Operation Switch together with the lockable Remote/Stop/Site shift Switch activates the internal Non-contact Lead Switch a non-contact method. Therefore, a good seal can be achieved, as it does not penetrate the Outer Cover. The Site Control Switch consists of a Remote/OFF/Local Select Switch as well as OPEN, STOP and CLOSE push buttons. with 3 LEDs Close(Green), Open Red), Fault(Yellow) The Outer Cover with Local Operation Switch can change direction every 90 degrees. Reach through wireless remote control function can operating. The SEIBU TMe-Series Actuator(interval the LCD display 5 meter).

**4.3 Position Detection** The TMe position detector by an absolute Encoder to real time record the valve position, even power off. resolution to 7.5° of output rotation(48 pulse per turn). Limit range configurable between 2.5 and 5461 output turns.

**4.4 Torque Detection** By using a Non-contact component Sensor, accurate torque can be measured and controlled.

**5. Handwheel** The side-mounted hand wheel is for a device that can be operated manually when the power is lost. The Manual/Electrical Lever can also be shifted manually in a safe manner when the motor is running. Manual/Electrical Shifting Lever can be fixed with padlock). Note: The electrical operation will supersede the Manual/Electrical Lever if it is not correctly fixed on the manual side. During start up, the Hammer Blow effect will activate the starting and shutoff of electrical and manual mode

**6. Thrust Base** The thrust bearing is built within the Thrust Base to remove the Actuator main body while maintaining the valve body in its position. The Stem Bush is provided during Valve Stem processing for easier assembly and disassembly.

**7. Gear reduction** Double gear reduction device. Easy to maintain. The major gears has been heat treatment. Power driven device assembled by spur gear set and worm gear.

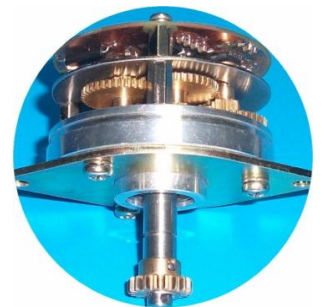
**8. Lubricate** TMe series are use Lithium grease#0 and all of gear set from TMe immersion in grease oil that runs long period.



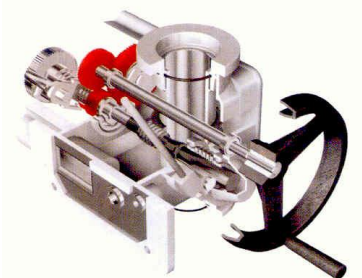
Non-Through Switch Control



control circuits



absolute Encoder



The internal parts

## SPECIFICATION

TMe series is an integral type of Actuator in which a circuit is provided to carry out local and remote electrical operation; it also includes an electric motor, reducing gear, reversible magnet contactor, electricity position limit and torque limit as well as monitoring function in IP68 IEC-529(6m deep for 48 hours) Double-sealed waterproofing container.

All position limit, torque limits and connections can be set from the Local Operation Switch without opening the Outer Cover. Please refer to the following instructions for details on standard or optional specifications. Should you need optional specifications, please inform us when inquiring about the price.

## STANDARD

**Power Source:** 60Hz(50Hz) 3Phase  
200,220/380,400,440,460,480,600V ◦

**Motor:**The 3-phase, F Class Insulation, and 15-minute rating and workable  $\pm 10\%$  of the rated power source with High Torque/Low Inertial Motor is used. thoro capsulation non-venting construct(TENV).Over 60 times per hour inch operation at the rated value.

**Signal output:** with 3 Relays(Max expand to 16 Relays---- Option)Full Open/Close Position signal output with each 1a1b contactor output. Rating AC250V 5A/DC125V 0.4A ◦

Alarm(Fault) signal output with 1a1b contactor output .Rating AC250V 5A/DC125V 0.4A ◦  
(Power Fault,Torque Fault , Motor Over Heat....etc.)

**Operation Temperature:**  $-25^{\circ}\sim+80^{\circ}$  Other temperature refer to us ◦

**ENCLOSURE IP68 IEC-529** ◦

**Position Indicator:** 0~100% continue LCD Display ◦

## Terminal Block

Control : 42 Points with M4 screw .rateing AC250V 5A ◦

Power : 3 Points with M6 screw.rateing AC660V 63A

## Space Heater

Embedded inside the circuit PCB fix up electrical resistance replaced emission of heat(about 5~40W) ◦

## Manual Operation

Auto-return is standard. Power to manual operation by change lever shifting ◦

## Conduit entry

1-1/2NPT\*1 1NPT\*2 ◦ M40\*1 M25\*2 for wiring. other required refer to us ◦

## Standard Coat

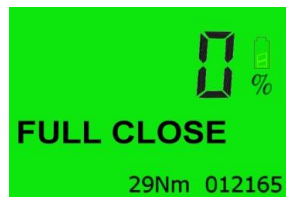
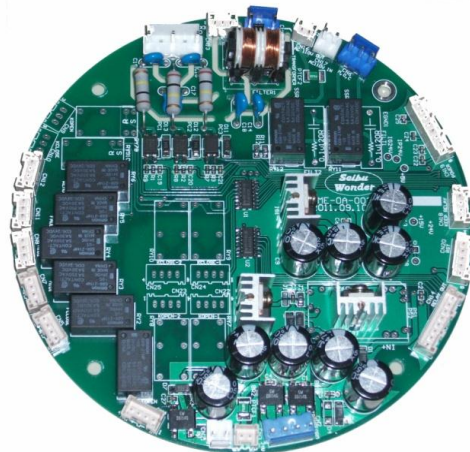
Vinyl resin wash primer plus polyurethane resin paint for final coat ◦

## Vibration:

Max applicable levels :In the frequency range of 2mm 13.2~100Hz 0.7G 90 minutes ◦  
Shock:30G/11ms X.Y.Z with each 3 times ◦

## Design Life

Under designed operating conditions (usage conditions: Maximum set torque at the travel end and 40% of allowable torque at the middle position), the service life of the ON-OFF specification is 10,000 times .



## OPTION

**1.Power Source:**Single phase ◦

**2.Motor:**Class H insulation .Option rating 30minutes or with brake ◦

**3.Signal output:** Standard with 6 Relays Can super addition to Max 10 Relays for specifying ◦ Contactor Output. Rating AC250V 5A DC125V 0.4A ◦ Example:Middle posotion, open torque and close torque contact point independence,etc....

**4.Inverter Drive** Opening and Closing speed can be adjustable with install of an Inverter, to change motor speed ◦ and through control panel can change Inverter`s speed & parameter setting ◦

**5. SSR Noncontactor reverse able switch motor drive.** For high speed ON-OFF motor control 60 times per min ◦

**6.Infrared remote control Function setting** by 12 key infrared remote control unit easy ,quick and safe .

### 7.Fielbus

Easy addition of the 2-wire communications network "PROFIBUS-DP" or "MODBUS" for remote control ◦ 32 stations without repeater with repeaters expandable up to 127 device ◦

### 8.Self-diagnosis function

It is possible to control the longevity and the condition of actuator and the valve being managed of various data (torque value,current value of the motor , and operation frequency [opening and closing count of each operation] etc ) ◦

**9.Explosion proof :** [Ex d II B+H<sub>2</sub> T4X](CNS)

**Mechanically and electrically** interlocked Reversing Contactor or 3phase "SSR" for high speed ON/OFF control to enhance the motor starting.

### 10.Analogous Percentage Control

The Percentage Control is used to adjust the open state of the Valve Door through analog current or voltage signal.

Signal Type: DC4-20mA, DC1-5V.

Open Control can be executed during the entire travel of the Valve Door (if required, even part of the travel). Set the Percentage Control/Remote Manual shifting and selection function in the operation circuit so that the manual operation can be remotely activated according to actual need. If the percentage signal is lost, the Fail-Safe Mode (open, close, local stop) can also be selected to prevent a Water Hammer effect.

### 11.Hold in Water Hammer effect

If the Valve Door opening and closing time must be extended to prevent a Water Hammer, use an Interrupter Timer (optional). Regardless of the opening and closing direction, it can make the motor run intermittently from any position of the Valve door. As for the operation time and stop time of intermittent valve door, both can be set within 1-99 seconds respectively. Further, the Interrupter Timer can also be controlled locally and remotely.

### 12.Transmitter

Signal output DC 4~20mA Accuracy ± 0.5% FS. Adjust range:Zero: ± 20%,Span: ± 20%.

### 13.Optional Coat

For the polluted area , extra coat ,on top of the standard coat,may be required refer to us.



**Infrared  
Remote control &  
setting**

## DESIGN

### 1. Perfect Protection (Water protection/explosion proof)

Elimination of water-caused breakdowns through double sealing of terminal section and achieving protection standard IP68 (6 meter 48 Hours) ◦ Protection of the actuator operating in hazardous area through explosion proof feature(Exd II BT-4) ◦

### 2. Easy maintenance (Reduction in inspection costs)

Reduction of maintenance time through drastic simplicity of structure  
Eco-design ◦ Improved reliability through reduced numbers of parts ◦

### 3. Self-diagnosis

Display of the next due-inspection through a self-diagnosis warning ◦  
(OPTION)

**4. Immediate operation just by plugging in** ◦ (Built-in control panel is standard) ◦ Superb reliability through all-in-one design ◦ Capable of easy connection to various telecommunication system ◦

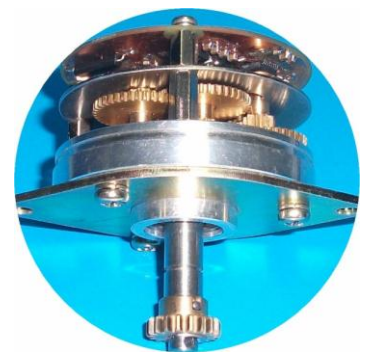
**5. The optional Remote Control** is used as a local operation switch. The Remote Control is provided with Open/Close/Stop buttons, which can be used within 5m of the LCD display. Further, this Remote Control can also be used to control the Actuator. (OPTION)

**6. password protect function** Through built in control panel or optional Remote Control unit finish with setting actuator within data and parameter ◦ settings may by password protect ◦

**JIS** (Japanese Industrial Standards)

**CE** (European Community)

**UL** (Under-writer's Laboratory )





## Protection Function

### 1. Automatic "Phase" Calibration

**Function.** The automatic phase calibration function can change the orientation of the 3-phase power to prevent valve damage resulting from improper wiring.

### 2. Prevent Phase-failure Operation

To prevent the motor from overheating, each of the three phases will be monitored at all times. Should a single or multiple phases fail, the Control Unit will stop the operation of the Actuator, This product is also armed with local and remote alarm warning functions.

### 3. Surge absorber join on power circuit PCB.

### 4. Motor Protection during Valve Jams

In the event the valve is under restricted status the Control Unit will stop the operation of Actuator if the valve position remains unchanged after the action start command is sent to prevent the motor from overheating. the control unit can detect output shaft if the motor is running but the output shaft is standstill pass through a few second (under 10sec ) ,the control un automated stop the motor.

### 5.The Use of Thermostat for Protection

The Thermostat is directly mounted on the motor end coil to monitor the motor temperature, and disconnects the Control Circuit if the motor coil is overheating.

### 6. Preventing Momentary Reverse

When the Actuator receives a momentary

generating an impact load to avoid unnecessary friction against the Valve Stem or the Reducer. In addition, this function can also inhibit the Surge produced by the Conductor.

### 7.Remote Control

Five signals are provided, namely, Open command, close command, stop/self-holding, Emergency Shutdown ESD, and percentage control permit.

The close signal can control either a self-holding type or Push-to-Run (fine-tune type).

The ESD function can control emergency shutdown/emergency open, and this ESD will be processed before other local or remote signals. In addition, it can also distinguish the Common Line of the ESD signal from that of other control signals.

### 8. Muck out Valve Foreign object & Stumbling block removal Function.

At Valve close near the Full Close position, stop the actuator utilize water wallop cleaning the Valve. When the Foreign object get stuck utilize Actuator repetition, open and close operation, exert muck out Valve Foreign object Function.

#### ■ Controller specification

Function Item	Specification	Remarks
Control CPU	16Bit 16MHz CPU (32Bit 20MHz CPU)	
LCD	Position(%) &Alarm disp.	
Basic operation	Change of site and distance Open.Stop.Close Operation	
speed adjustment	By A,B Gear or Inverter (OPTION)	
Position adjustment	0%,100% and Open/Close and Middle position four Points freely	The amount of the movement of warm is detected by electronic absollute encoder
Torque adjustment	Able to setup freely between 30~1 00% of Maxtorque and able to set up every 1%	The amount of the movement of warm is detected by non-contactpotentionmeter. Accuracy 5%
Backup	1 Year after supply off	Battery life 5 Years
Option	Propor control(4~20mA or 0~5V) Fielbus (PROFIBUS or MODBUS RTU) Self diagnosis function	

# ACTUATOR SIZING



TYPE	rpm at 60Hz	14.8	19.3	25.4	33.4	44.5	58.0	76.2	100.3	133.6	174.2
	50Hz	12.4	16.1	21.2	27.8	37.3	48.2	63.7	83.5	111.9	145.8
	MOTOR (KW)	MAX TORQUE , kgf.m N.m									
TMe-01	0.2	12.8 125.4	9.9 97	7.5 73.5	5.7 55.9	5.0 49.0	3.8 37.2	2.9 28.4	2.2 21.5	-	-
	0.4	15.0 147.0	15.0 147.0	15.0 147.0	13.2 129.4	11.5 112.7	8.9 87.2	6.7 65.7	5.1 50.0	2.7 26.5	2.8 27.4
	0.75		15.0 147.0	15.0 147.0	15.0 147.0	15.0 147.0	14.0 137.2	10.6 103.9	8.1 79.4	5.9 57.8	4.5 44.1
TMe-04	0.4	34.6 339.1	26.6 260.7	20.2 198.0	15.4 150.9	13.2 129.4	10.1 99.0	7.7 75.5	5.9 57.8	4.3 42.1	3.2 31.4
	0.75	54.5 534.1	41.9 410.6	31.8 311.6	24.2 237.2	20.8 203.8	15.9 155.8	12.1 118.6	9.2 90.2	6.7 65.7	5.0 49.0
	1.5		56.0 548.8	56.0 548.8	51.9 508.6	40.2 394.0	34.2 335.2	26.0 254.8	19.8 194.0	14.7 144.0	11.2 109.7
	2.2		56.0 548.8	56.0 548.8	56.0 548.8	54.0 529.2	46.7 457.7	35.4 346.9	27.0 264.6	19.8 194.0	15.3 149.9
TMe-07	1.5	86.0 842.8	86.0 842.8	68.2 668.4	70.9 508.6	44.5 436.1	34.2 335.2	26.0 254.8	19.8 194.0	14.7 144.0	11.2 109.7
	2.2	86.0 842.8	86.0 842.8	86.0 842.8	70.9 694.8	60.7 594.9	46.7 457.7	35.4 346.9	27.0 264.6	19.8 194.0	15.3 149.9
	3.7		86.0 842.8	86.0 842.8	86.0 842.8	84.0 823.2	65.7 643.9	49.8 488.0	38.0 372.4	28.1 275.4	21.5 210.7
	5.5		86.0 842.8	86.0 842.8	86.0 842.8	86.0 842.8	86.0 842.8	86.0 842.8	67.7 663.5	50.5 494.9	38.6 378.3
TMe-1	2.2	159.4 1562.1	122.5 1200.5	93.0 911.4	70.9 694.8	60.7 594.9	46.7 457.7	35.4 346.9	27.0 264.6	19.8 194.0	15.3 149.9
	3.7	184.0 1803.2	172.8 1693.4	131.0 1286.7	100.1 981.0	85.6 838.9	65.8 644.8	50.0 490.0	38.1 373.4	28.3 277.3	21.7 212.6
	5.5		184.0 1803.2	184.0 1803.2	177.3 1737.5	140.0 1372.0	116.7 1143.7	88.6 868.3	67.7 663.5	50.5 494.9	38.6 378.3
	7.5				184.0 1803.2	180.0 1764.0	159.1 1559.2	120.8 1183.8	92.0 901.6	68.5 671.3	52.5 514.5

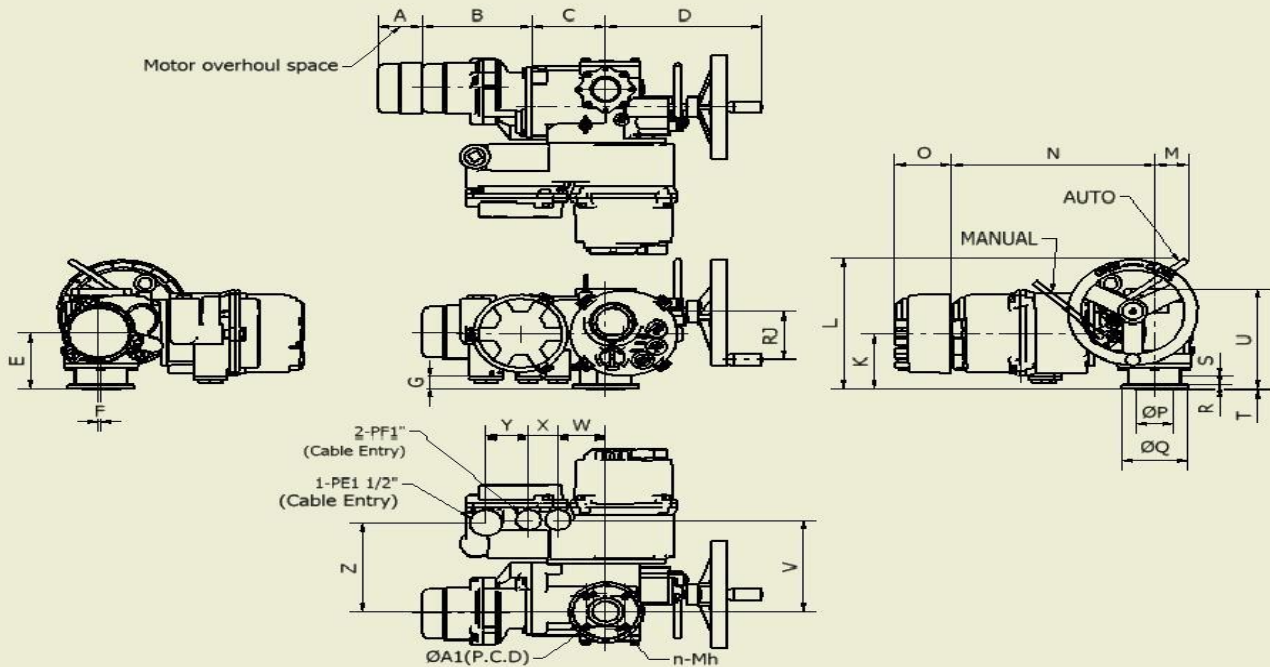
- Data above are for 220V 3ph 60Hz input power. For other voltages refer to us.
- If the torque values is empty, also can be offered for option.



## Mechanical Data

Allowable torque	Allowable thrust	Allowable stem	Handwheel	Flange dia
Kgf-m Nm	Ton KN	key threaded mm	dia. m	ISO No tap PCD/size pilot dia., mm
15.0 147	7 68.6	34 40	$\leq 33.4\text{rpm}$ ( $\eta=0.3$ ) ratio : 16.8:1 25.3:1(option) $\geq 44.5\text{rpm}$ ( $\eta=0.35$ ) ratio : 5.6:1 15.3:1(option) dia. : 0.245m (rad. : 0.1225m)	dia 125mm ISO No F10 tap PCD 102 bolt 4-M10 pilot dia. 70mm
56.0 548.8	13 127.4	50 58	$\leq 33.4\text{rpm}$ ( $\eta=0.35$ ) ratio : 40:1 62.4 : 1(option) $\geq 44.5\text{rpm}$ ( $\eta=0.4$ ) ratio : 13.3:1 20.8:1(option) 29.1:1(option) dia. : 0.245m (rad. : 0.1225m) (0.355m option)	dia 175mm ISO No F14 tap PCD 140 bolt 4-M16 pilot dia. 100mm
86.0 842.8	16 156.8	60 72	$\leq 33.4\text{rpm}$ ( $\eta=0.35$ ) ratio : 45.9:1 72.3 : 1(option) $\leq 44.5\text{rpm}$ ( $\eta=0.4$ ) ratio : 15.3:1 24.1:1(option) dia. : 0.355m (rad. : 0.1775m) (0.45m option)	dia 210mm ISO No F16 tap PCD 165 bolt 4-M20 pilot dia. 130mm
184.0 1803.2	27 264.6	80 95	$\leq 33.4\text{rpm}$ ( $\eta=0.35$ ) ratio : 71.1:1 73.9:1(option) 142.2:1(option) $\geq 44.5\text{rpm}$ ( $\eta=0.4$ ) ratio : 23.7:1 24.6:1(option) 71.1:1(option) dia. : 0.45m (rad. : 0.225m) (0.55m option)	dia 300mm ISO No F25 tap PCD 254 bolt 8-M16 pilot dia. 200mm

## DIMENTION



Model	A	B	C	D	E	F	G	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	A1	n-Mh	Max. Stem Dia	
																											Bore and key	Theraded
TME-01	40	223	135	270	132	4	19	70	119	358	83	381	150	70	125	10	20	3	235	199	31	55	80	189	102	4-M10	Ø34	Ø40
TME-04	75	295	140	330	155	5	45	110	145	424	88	409	150	100	175	10	28	4	282	227	20	55	80	217	140	4-M16	Ø50	Ø58
TME-07	85	322	155	396	185	1	73	157	173	523	125	437	150	130	210	15	30	5	330	255	14	55	80	245	165	4-M20	Ø60	Ø72
TME-1	85	400	185	453	210	0	75	200	183	492	45	457	150	200	300	15	28	5	345	275	14	55	80	265	254	8-M16	Ø80	Ø95

## Materials of Construction (For major parts)

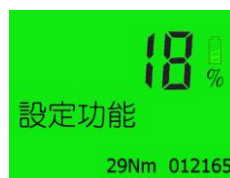
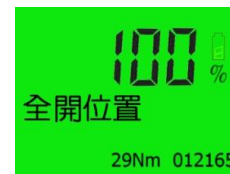
PARTS	METERIAL	JIS NO.		ASTM NO.	DIN NO.
GEAR CASE & COVER	Al. Alloy die casting	H-3156	H-5102	B-85	1725
THRUST UNIT	Spheroidal graphitic	B-2118	G-5502	A-536	
STEM BUSH	Copper Alloy	H3124	H-3250	B-133	1693
WORM	Chromium molybdenum	G-3068	G-4105	B-133	1787
WORM WHEEL	High strength brass casting	G3068	G-4105	A-148	17200
GREASE	Lithium grease	K-5041	K-2220	ISO. LXBCA(MULIS)	1709



## The TMe display

Include numeral area (0--100%) and characters area. The numeral area is displayed the valve position. Actuator text display indication of the following status/alarms:

Closed Limit,  
 Open limit,  
 Opening,  
 Closing,  
 Stopped  
 Opening Torque trip  
 Closing, torque trip  
 Opening, active,  
 Thermostat trip,  
 Phase lost, ,  
 Configuration error,  
 Position sensor failure,  
 Torque sensor failure ,  
 Battery low,  
 Power loss inhibit  
 ....etc



## OPERATION CONTROL PANEL & LCD DISPLAY



LCD Display  
 LED

RED : for full open  
 YELLOW : for fault  
 GREEN : for full close

RED OPEN BUTTON

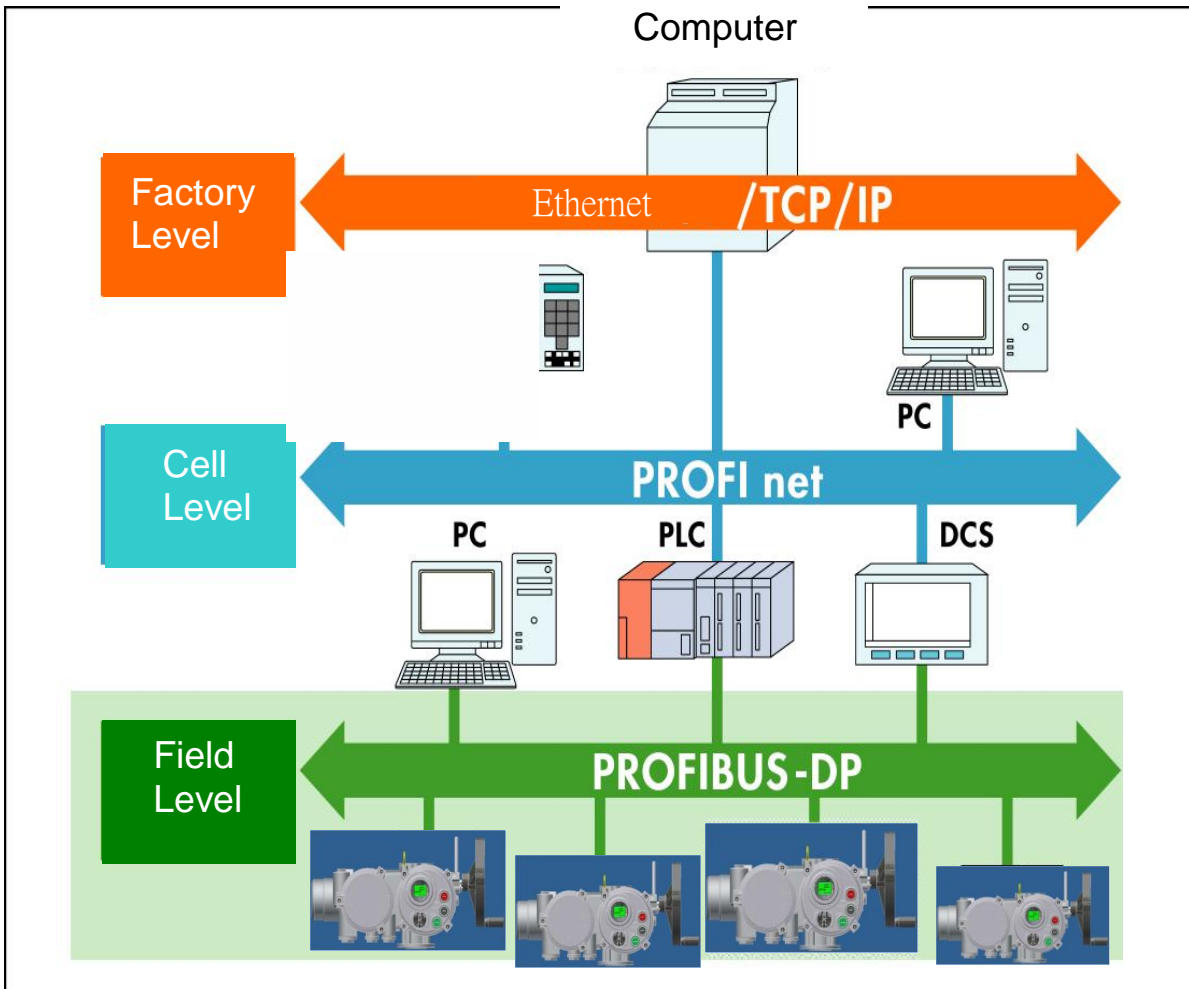
BLACK STOP BUTTON

GREEN CLOSE BUTTON

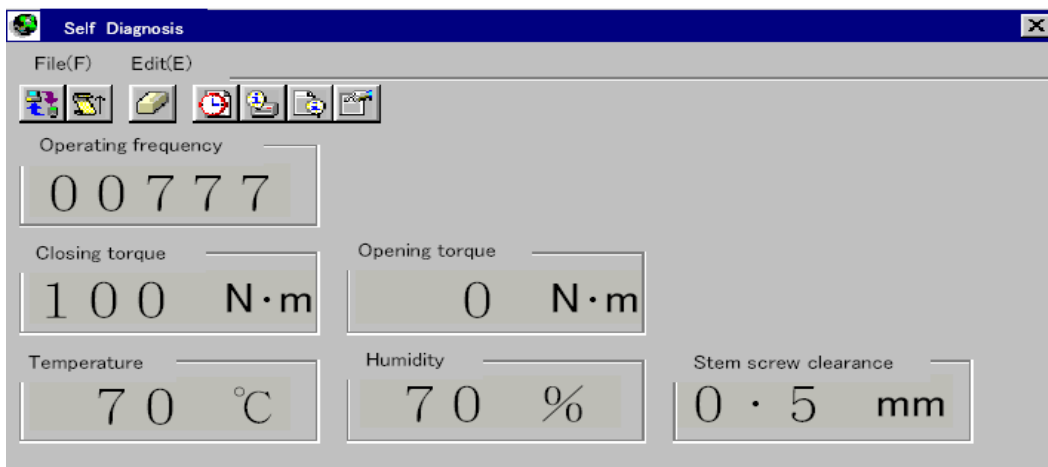
REMOTE/ STOP /LOCAL  
 SELECT SWITCH

## Digital communication function(OPTION)

International Standard Digital Communication(**ProfiBus or Modbus**) is capable to be setup easily  
By **ProfiBus or Modbus** option a master PC can monitoring 124 Valve control unit is possible



## Self Diagnosis Function(OPTION)



**QUALITY CONTROL** All the processes from design through the delivery of actuators, including preinspecting of individual parts or modules, are performed in strict accordance with the Quality Assurance Procedures certified by 2000 years of ISO 9000 and Seibu Electric & Machinery Co., Ltd technical licensor to Wonder Chance. Every actuator is tested finally before delivery and a test certificate is issued. Designed torque values, hand/auto function are checked at the specially developed test console and recorded on the test certificate.



Design



Assembly & TEST



CNC Machining



Coordinate Measuring Machine



CNC Lathe



Quality Control



# TMe Series



**TM -type**



**TMP -type**



**TKe quarter turn**



**LTKD/LTMD-type**



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