Electric Motor Actuator with a built in Microcomputer
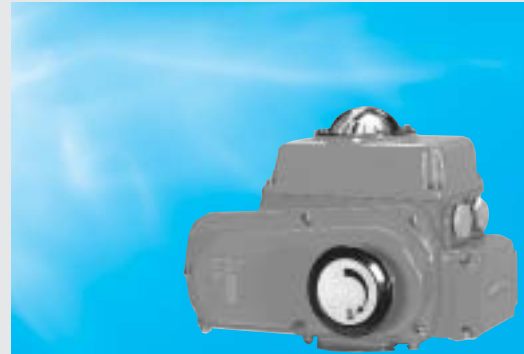
New MICOM ELMY®II

The New MICOM ELMYII offers highly accurate controllability, and its various functions are easily set via communication with a personal computer.
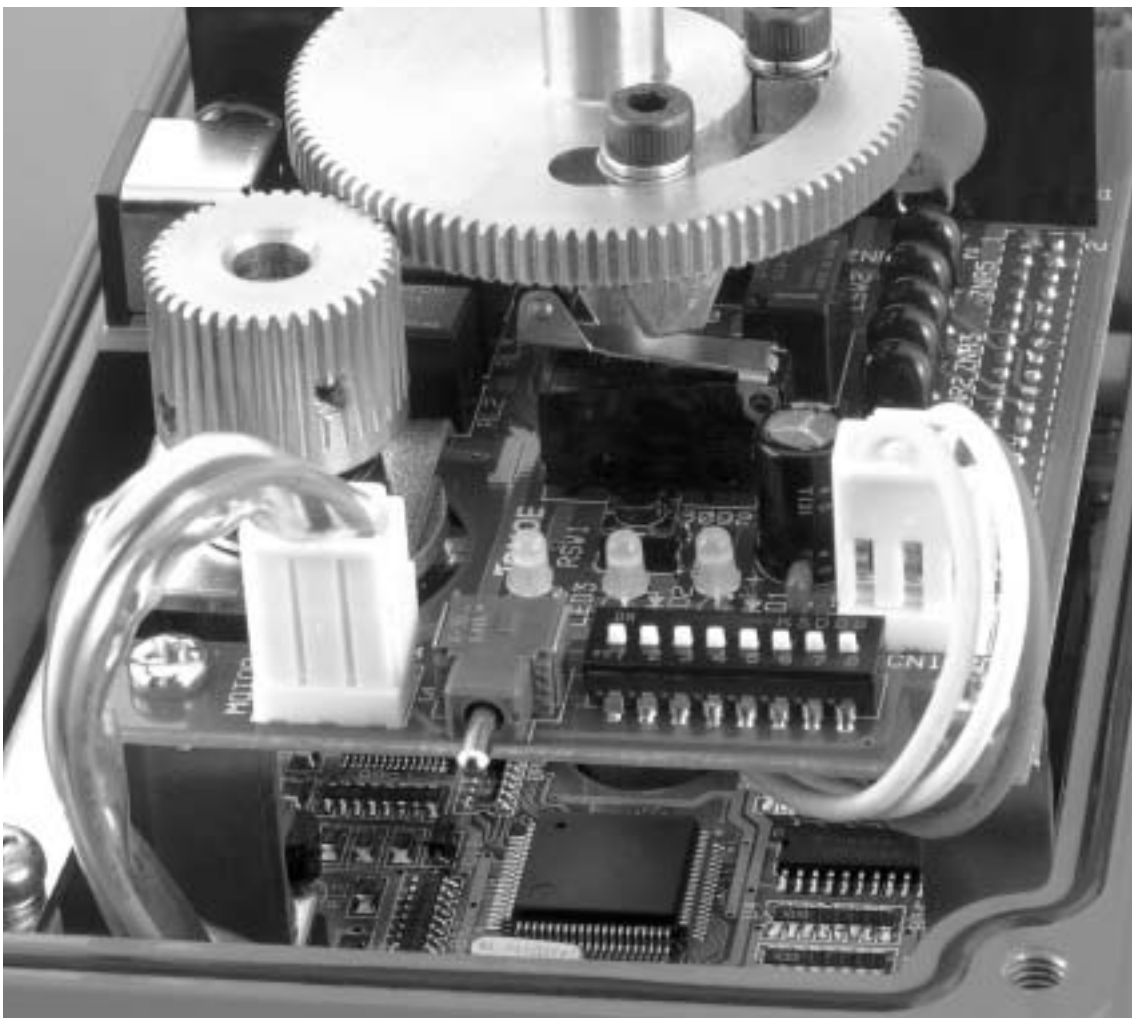
Controller features

Flow characteristics can be set at work site with PC.
High reliability
**Adjustable operating speed**
Multiple functions
Compact

TOMOE

New MICOM ELMY Ⅱ Specifications (Controller)

Model	New MICOM ELMY Ⅱ
Input signal	4 to 20mA DC (input resistance 250 ohm) 1 to 5V DC
Non-voltage contact input	Open close signal (a contact)
Output signal	4 to 20mA DC (load resistance 300)
Non-voltage contact output	Open close contact signal (Capacity AC220V-0.3A, DC24V-1A) Alarm output for hunching and thermal rising (Capacity AC220V-0.3A, DC24V-1A) Power off output for excessive torque and thermal rising (Capacity AC220V-0.3A, DC24V-1A)
Operation frequency rate	50% ED or less
Inching operation	60 times min. or less
Positioning accuracy	± 1% (For operation range of 90 degrees C, input signal amplitude of 16mA during linear operation.)
Resolution	1 200 (For operation range of 90 degrees C, input signal amplitude of16mA during linear operation.)
Flow characteristic variation	Cv linear settings (concentric and eccentric type are built into controller.) Disc angle linear settings Flow linear settings
Input signal mode	Direct, reverse
Input signal failure mode	Stop, open, close or optional position
Output signal mode	Direct, reverse
Zero-span adjustment range	-5 to 95 degrees C
Hysterisis adjustment range	0.5 to 4.0% at full span
Operation speed control	Range and operation speed can be adjusted.
Protection function	Limit switch at full open and close Mechanical stopper

Resolution is set at 1/100 at the time of shipment. If any other resolution is required, please contact us.

New MICOM ELMY Ⅱ Specifications (Actuator)

Type	Type 0	Type 1	Type 2	Type 2.5	Type 3	Type 4
Output torque N m	70	98	196	333	981	2000
Power source V	AC100, 200, 220 50/60Hz					
Motor capacity W	8W	20W	30W		90W	
Operating range	0 to 90 degrees C					
Travel time 50 60Hz sec	25/20 sec(0 to 90 degrees C)			37/30 sec (0 to 90 degrees C)	55/50 sec (0 to 90 degrees C)	125/105 sec (0 to 90 degrees C)
Insulation	Class E					
Enclosure	JIS C 0920 (IP 65), Class 5, dust and water-jet proof type					
Protect function	Built in mechanical thermal protector stopper at full open and close side					
Conduit connections	G1/2 PF1/2 2 port					
Manual operation	Detachable handle	Declutchable handwheel				
Motor protection	Built-in thermal protector					
Mechanical stopper	End of travel positioning bolt					
Environmental temperature during operation	10 to 50 degrees C					
Environmental temperature during storage	30 to 80 degrees C					
Paint finish	Epoxy-melanin baked with Munsell 2.5BG 6/12					

TOMOE's software is compatible with Windows® 98, 2000 and ME.

Setting functions
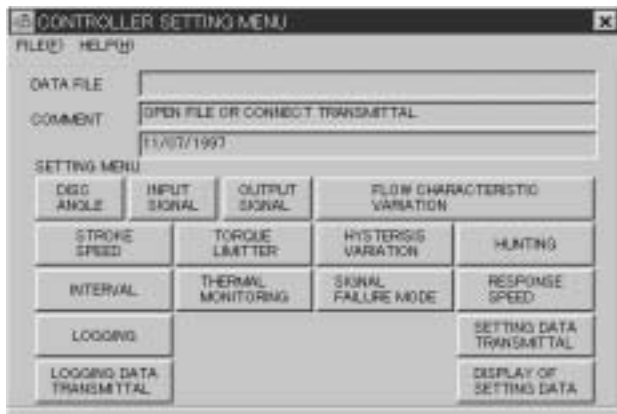
Various functions are easily set with a personal computer at the job site. Factory setting is also available for specific customer requests. TOMOE's software and instruction manual are available for purchase.
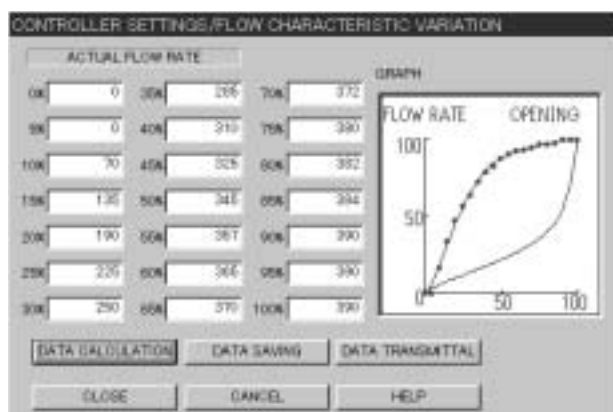
Variable flow characteristics

Based on the actual flow rate at each opening degree, the relationship between valve movement and input signal can be varied.
Linear characteristics can be achieved as follows:
  Input signal: 20%
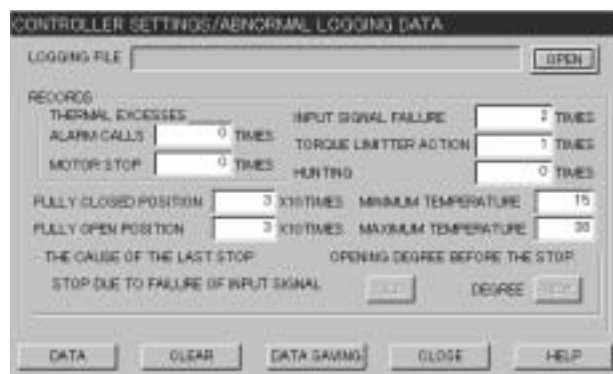 Opening angle: 20%
  Actual flow rate: 50%
After setting;
  Input signal: 20%
  Opening angle: 8%
  Actual flow rate: 20%
Low rate data can be set at each 5% of opening. If flow rates at certain angles are not known, the program will automatically compensate for this to achieve the necessary data.°°°°°°°

Abnormal data logging

The unit monitors actual operating conditions.
Using this function, the operator can predict the cause of potential problems.
The number of alarm calls due to thermal excesses in the actuator, the action of the torque limiter and the frequency of hunting during operation, are all recorded.
Opening and closing stroke time can also be recorded. This enables the operator to plan maintenance routines and schedules.
Make good use of this function to improve accuracy, valve sizing, and opening speed characteristics.
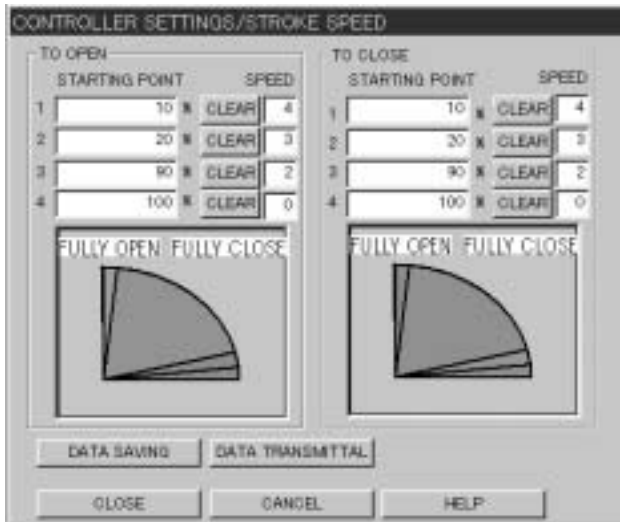
Speed control adjustment

Stroke time can be varied with up to 5 intermediate stages.
Stroke times for open to close and close to open can be set independently.
Make good use of this function to improve the performance of pump discharge
valves, quick opening characteristics, or to prevent water hammer.
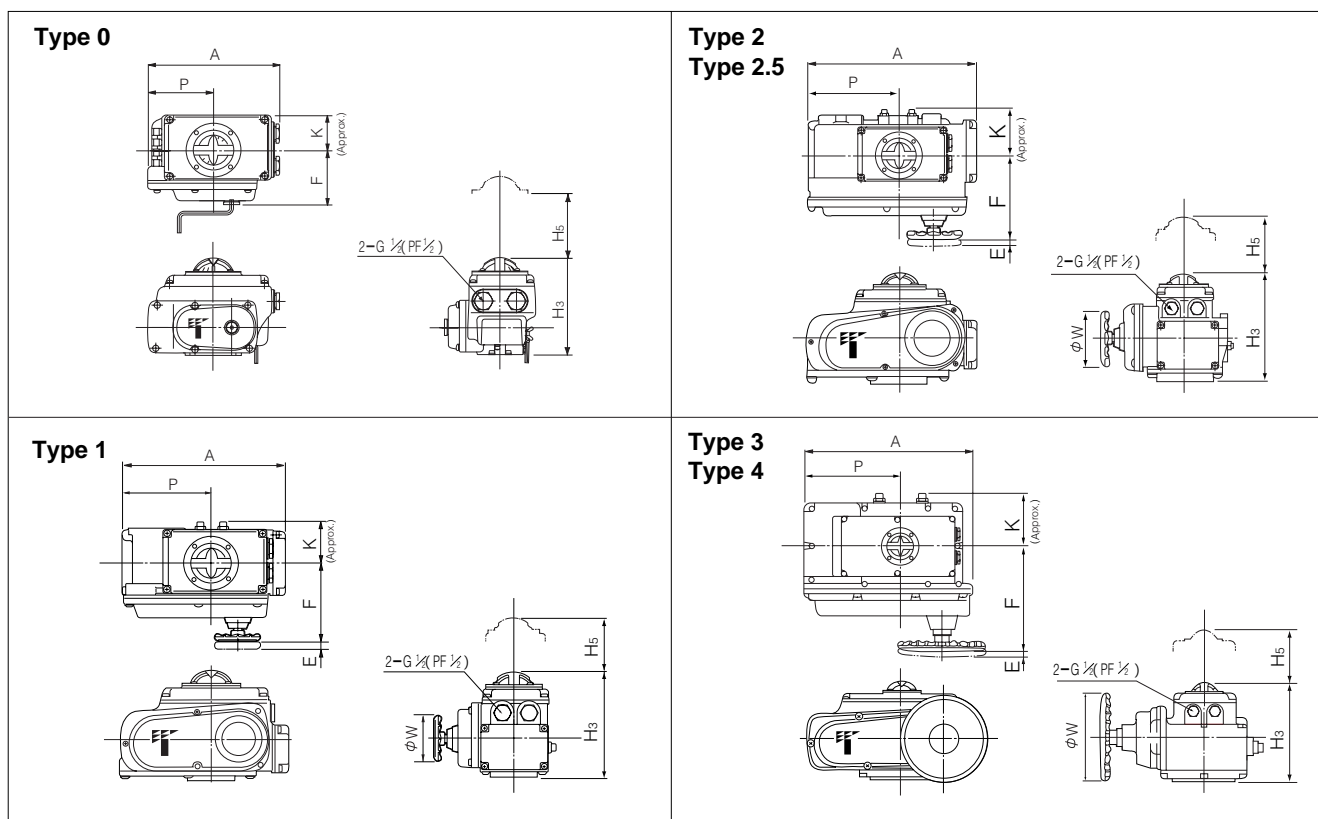
Note: After setting the speed, the electric motor motion should be as shown below.
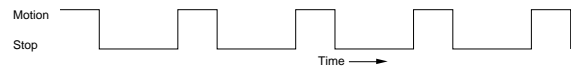
Display of setting data

On screen display of setting data helps you to maintain accurate
records and avoid setting errors.
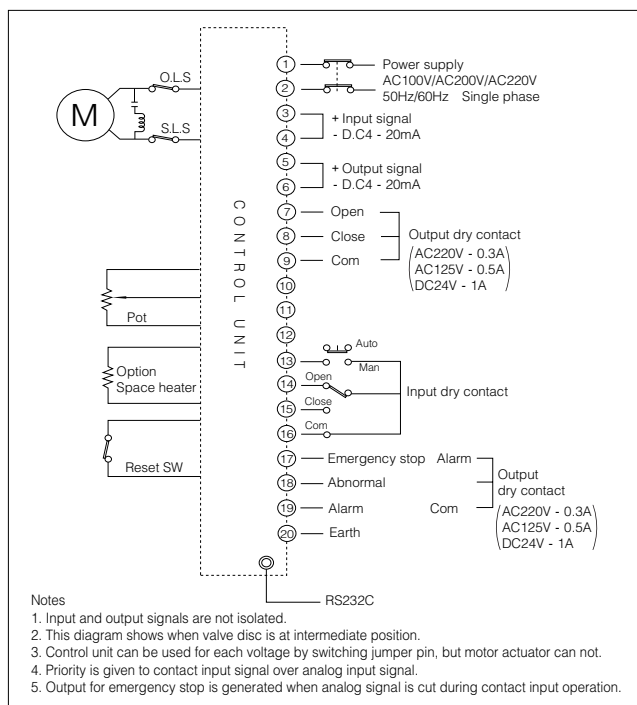
New MICOM ELMY Ⅱ Dimensions diagram

Type 0

Type 2
Type 2.5

Type 1

Type 3
Type 4

New MICOM ELMY Ⅱ Dimensions

Motor type	Dimensions mm								Approx. Mass (kg)
	H₃	H₅	P	A	E	F	K	W	
Type 0	185	100	100	202	43	85	54		4.2
Type 1	191(193)	100	138	252	12	126	65	70	6.4
Type 2	224(227)	100	167	310	14	154	85	100	11.2
Type 2.5	224(227)	100	167	310	14	154	85	100	12.8
Type 3	255(258)	100	223	388	23	246	136	200	23.2
Type 4	255(258)	100	223	388	23	246	136	280	28.3

(   ) shows non-ISO top dimension

The figure in (   ) is for other than 700G.

New MICOM ELMY II Wiring diagram

Notes
1. Input and output signals are not isolated.
2. This diagram shows when valve disc is at intermediate position.
3. Control unit can be used for each voltage by switching jumper pin, but motor actuator can not.
4. Priority is given to contact input signal over analog input signal.
5. Output for emergency stop is generated when analog signal is cut during contact input operation.

New MICOM ELMY II Operation
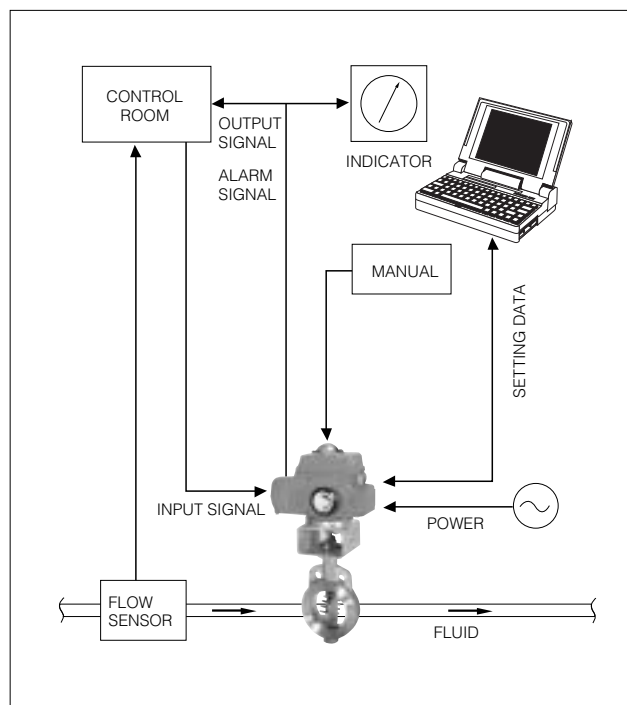
New MICOM ELMY II Control functions

Function	By software	By DIP switch	Standard factory settings
Opening angle settings			0-90 or 0-70 degrees
Input signal settings			4-20mA
Output signal settings			4-20mA
Signal failure mode			Emergency stop
Signal failure mode variation		×	1mA or less is 5 sec.
Flow characteristic variation		Signal linear, CV linear for concentric type of valve, and CV linear for eccentric type of valve	No correction (linear signal)
Hysterisis variaton		×	Input signal: 1.0% Angle signal: 0.5%
Hunting setting		×	Time for judgment: 180 sec Frequency of operation: 90 Operation angle range: 10 degrees Average angle: 5 degrees
Hunting interval setting		×	Signal hysteresis transition: 0.5% Interval limit hysteresis: 2% Automatically returns to hysteresis of time of shipping after 6 hrs.
High frequency operation		×	When signal hysteresis exceeds 2% for hunting interval
Abnormal output shaft operation		×	30 sec. × 3 times
Temperature monitoring		×	Alarm: 50℃
Communication speed		×	9600bps
Logging data transmittal		×	
Display of setting data		×	

New MICOM ELMY II Initial setting mode at the time of shipment

Input signal	Reverse action
Output signal	Reverse action
Flow rate adjustment	No adjustment
Action at the time of abnormal situation	Emergency stop
Flow adjustment data	Hold the data before reset
Setting mode entry	Operation mode

New MICOM ELMY II Operating system

| Usage environment	RS232C interface (Connector: D-sub 9-pin) PC that can run Windows 2000, ME or 98 (Please consult us regarding Windows XP support.) Connect to PC with dedicated cable.

New MICOM ELMY II Terminal board

Notes
1. Input and output signals are not insulated.
2. Use FG terminal for earth.
3. Priority is given to contact input of terminal Nos. 14 to 16 over input signals of Nos. 3 and 4. Even terminal No. 13 is set to AUTO.

Terminal block screw size: M3 (with washer)

Wiring diagram
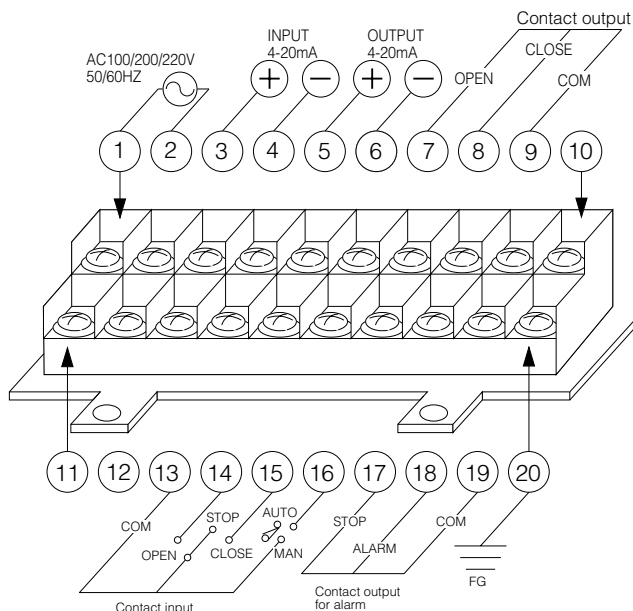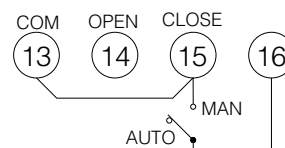

New MICOM ELMY II Contacts

Terminals

|	Terminal No.	Purpose	Capacity
Contact output	No. 7 (OPEN)	Outputs at full open position	AC220V-0.3A DC125V-0.5A DC24V-1A
	No. 8 (CLOSE)	Outputs at full closed position	
	No. 9 (COM)	COM for No. 7 and 8 terminals	
	No. 17 (STOP)	Outputs when abnormally stopped [1]	
	No. 18 (ALARM)	Outputs when alarm signal transmitted [2]	
	No. 19 (COM)	COM for No. 17 and 18 terminals	
Contact input	No. 13 (COM)	COM for No. 14, 15 and 16 terminals	
	No. 14 (OPEN)	Connect No. 13 when valve moves toward open direction	
	No. 15 (CLOSE)	Connect No. 13 when valve moves toward closed direction	
	No. 16 (AUTO/MAN)	Switching of auto and manual operation.	

*1: No. 17 works during signal failure, abnormal torque or temperature increase.
*2: No. 18 works during hunting or abnormal temperature increase.

Wiring diagram example
for combination of auto and manual
Operation by 4-20 mA signal.
Closed during manual operation.

Operation by 4-20 mA signal.
Open during manual operation.
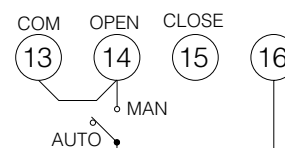
New MICOM ELMY II Function and dip switch position

| Setting item	Setting of dip switch							
	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
Input signal								
Reverse action	OFF						OFF	OFF
Direct action	ON						OFF	OFF
Output (feedback) signal								
Reverse action		OFF					OFF	OFF
Direct action		ON					OFF	OFF
Opening degree adjustment								
None(Linear in accordance with signal)			OFF	OFF			OFF	OFF
Cv linear for concentric valve			OFF	ON			OFF	OFF
Cv linear for eccentric valve			ON	OFF			OFF	OFF
For customer use			ON	ON			OFF	OFF
Signal failure mode								
Stop					OFF	OFF	OFF	OFF
Fully open					ON	OFF	OFF	OFF
Fully close					OFF	ON	OFF	OFF
Memorized opening degree					ON	ON	OFF	OFF
*Initialization of setting data								
Hold							OFF	OFF
Initialize							ON	OFF

Notes
1. Reset is necessary after switching.
2. An asterisk means all setting data (such as valve opening degree, input signal, zero span of output single, etc.) will be initialized.
3. Input signal: Reverse action: signal increase open
           Direct acton: signal increase close
4. Output signal: Reverse action: valve open signal increase
           Direct action: valve close signal increase
5. Shaded areas mean initial setting mode at the time of shipment.
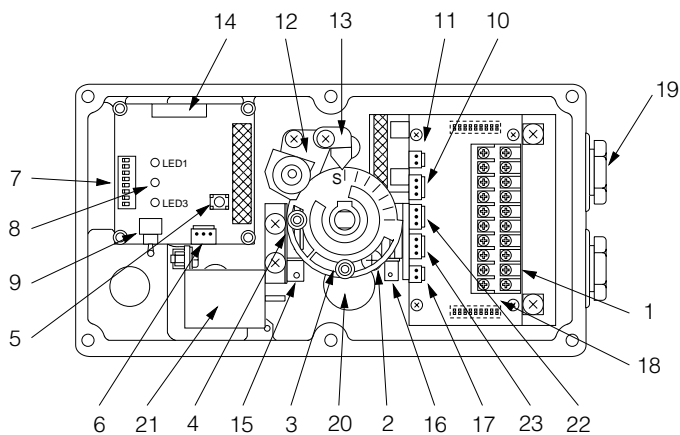
New MICOM ELMY II Parts list

Types 0, 1, 2 and 2.5
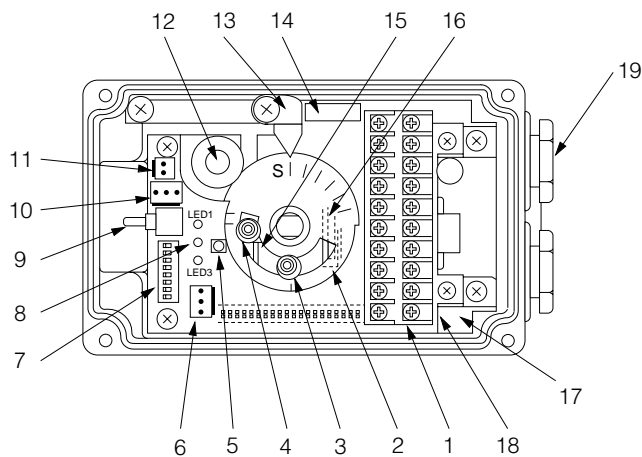
1	Terminal
2	Limit switch cam
3	Dog for open position
4	Dog for closed position
5	Reset switch
6	Connector for potentiometer
7	Dip switch
8	LED
9	Toggle switch
10	Connector for motor
11	Connector for motor capacitor
12	Potentiometer
13	Sub-indicator
14	Connector for interface
15	Limit switch (closed position)
16	Limit switch (open position)
17	Connector for heater
18	Jumper pin
19	Gland entry

New MICOM ELMY II Parts list

Types 3 and 4

1	Terminal
2	Limit switch cam
3	Dog for open position
4	Dog for closed position
5	Reset switch
6	Connector for potentiometer
7	Dip switch
8	LED
9	Toggle switch
10	Connector for motor
11	Connector for motor capacitor
12	Potentiometer
13	Sub-indicator
14	Connector for interface
15	Limit switch (open position)
16	Limit switch (closed position)
17	Connector for heater
18	Jumper pin
19	Gland entry
20	Coil
21	Capacitor
22	Connector for open limit switch
23	Connector for closed limit switch

New MICOM ELMY II Recommended fuse and non-fuse breaker

Type	Power source and frequency	Recommended capacity for fuse	Recommended capacity for non-fuse breaker
0, 1	100V/110V 50Hz/60Hz	3A	3A
0, 1	200V/220V 50Hz/60Hz	2A	2A
2, 2.5	100V/110V 50Hz/60Hz	5A	5A
2, 2.5	200V/220V 50Hz/60Hz	3A	3A
3, 4	100V/110V 50Hz/60Hz	10A	10A
3, 4	200V/220V 50Hz/60Hz	7A	7A