tyco
Flow Control

BIFFI

Compact electric actuator for 90° operation, complete with the intelligent control unit ICON 2000 to fit small valves.

Mechanical features

- Light weight and compact design, mounting flange acc. ISO 5211
- Constant torque for complete operating stroke
- Torque control in both rotation directions
- Double spur gear reduction and planetary gear system for a high reduction ratio with inherent self-locking characteristics.
- All gearing with cut teeth, metal made, running in oil for high and constant efficiency and low power consumption
- All rotating parts supported by roller bearings and a permanent oil lubrication
- Manual operation always engaged but not rotating during automatic operations
- Mechanical adjustment of the position by mechanical stops connected directly to the actuator housing
- Anodized aluminium enclosures, protection by epoxy-polyurethane painting

Features ICON 2000

- Easy set-up and commissioning
- Initial tuning without unscrewing a single bolt or nut
- Reduced set-up time
- Double displays
- Position indication in case of power failure
- Local push buttons for full actuator access
- Password protection to avoid unauthorized access
- Diagnostics are displayed in one of the available languages for both alarms and warnings
- Reduced number of parts ensures higher reliability and lower maintenance cost

Environment protection

- **Only waterproof**
  IP 68 according to IEC 529 and CEI EN60529 (15m dept/90 hours), or alternatively NEMA 4, NEMA 4X and NEMA 6 according to NEMA ICS6.
- **Standard explosionproof degree**
  Eex-d IIB T4 according to EN50014, EN50018 and EN50281-1-1 Class I, div. 1 group C and D – Class II, III, div. 1 groups E, F and G.

  IP 68 according to IEC 529 and CEI EN60529 (15m dept/90 hours), or alternatively NEMA 4, NEMA 4X and NEMA 6 according to NEMA ICS6

General application

Suitable for actuation of ball, plug, butterfly valves or dampers.
Heavy duty applications such as oil and gas, petrochemical, power and water industries.

Technical data

Voltages	:	110/220V-1Ph-50Hz 115/240V-1Ph-60Hz 230/400V-3Ph-50Hz 240/415V-3Ph-50Hz 440/480V-3Ph-60Hz
Torques	:	up to 600 Nm
Time/90° stroke	:	from 6 up to 60 sec.
Temperature	:	-30°C to +85°C For other temperature ranges please contact Sales office

Performances

Nominal torque (Nm) and time (sec) for 90 degrees of rotation at 50Hz/60Hz							Handwheel	
Model	**6/5**	**12/10**	**15/12**	**30/25**	**45/37**	**60/50**	**torque factor**	**turns/90°**
F01.150-052			**150**					
F01.150-054				**150**				
F01.150-056					150			
F01.150-058						150		
F01.150-052	150							
F01.150-054		150						
F01.300-052			**300**					
F01.300-054				**300**			$48x10^{-3}$	21
F01.300-056					300			
F01.300-058						300		
F01.300-102	300							
F01.300-104		300						
F01.600-102			600					
F01.600-104				**600**				
F01.600-106					600			
F01.600-108						**600**		
Ratio	1036:1	1036:1	2759:1	2759:1	2759:1	2759:1		

Definitions

- Actuator duty according to IEC 34-1: On-Off: S2-30 minutes
  Inching: S4-25%, max 200 starts/hour
- Nominal torque = the output torque given by the actuator when the torque device is set and trips at max settable value of its scale
- Stall torque = from 1.4 to 2 times the nominal torque
- Time for 90° rotation = the actuator nominal operating time when the running torque is yielded
- Running torque = 0.4 times the nominal torque
- Hand-wheel torque factor = multiply the required output torque by this factor to obtain the hand-wheel torque
- Bold-faced values represent the performances of Standard models with 3-ph motors
- Identification code: Model/Nominal torque-time at 50 or 60Hz
  e.g.: F01.150-032/150-12

Notes

1. The above characteristics are referred to the actuators with 3-phase or 1-phase asynchronous motors
2. For modulating duty, please contact Sales office.

Electrical details 3-phase supply

Model	400V-50Hz-3Ph							415V-50Hz-3Ph							480V-60Hz-3Ph						
	KW	RPM	In(A)	Is(A)	Icc(A)	PF	Eff	KW	RPM	In(A)	Is(A)	Icc(A)	PF	Eff	KW	RPM	In(A)	Is(A)	Icc(A)	PF	Eff
F01.150-052	0.040	2820	0.25	0.40	1.00	0.47	0.52	0.040	2820	0.22	0.40	1.00	0.47	0.54	0.048	3380	0.25	0.40	1.00	0.47	0.49
F01.150-054	0.020	1400	0.16	0.20	0.40	0.42	0.46	0.020	1400	0.15	0.20	0.40	0.42	0.44	0.024	1680	0.16	0.20	0.40	0.42	0.43
F01.150-056	0.014	930	0.14	0.20	0.40	0.38	0.40	0.014	930	0.12	0.20	0.40	0.38	0.43	0.017	1120	0.14	0.20	0.40	0.38	0.38
F01.150-058	0.010	700	0.12	0.20	0.50	0.36	0.35	0.010	700	0.10	0.20	0.50	0.36	0.39	0.012	840	0.12	0.20	0.50	0.36	0.34
F01.300-052	0.040	2820	0.25	0.40	1.00	0.47	0.52	0.040	2820	0.22	0.40	1.00	0.47	0.54	0.048	3380	0.25	0.40	1.00	0.47	0.49
F01.300-054	0.020	1400	0.16	0.20	0.40	0.42	0.46	0.020	1400	0.15	0.20	0.40	0.42	0.44	0.024	1680	0.16	0.20	0.40	0.42	0.43
F01.300-056	0.014	930	0.14	0.20	0.40	0.38	0.40	0.014	930	0.12	0.20	0.40	0.38	0.43	0.017	1120	0.14	0.20	0.40	0.38	0.38
F01.300-058	0.010	700	0.12	0.20	0.50	0.36	0.35	0.010	700	0.10	0.20	0.50	0.36	0.39	0.012	840	0.12	0.20	0.50	0.36	0.34
F01.300-102	0.080	2850	0.40	0.50	1.50	0.56	0.54	0.080	2850	0.35	0.50	1.50	0.56	0.57	0.096	3420	0.40	0.50	1.50	0.56	0.52
F01.300-104	0.040	1420	0.30	0.40	1.00	0.42	0.48	0.040	1420	0.30	0.40	1.00	0.42	0.44	0.048	1700	0.30	0.40	1.00	0.42	0.46
F01.600-102	0.080	2850	0.40	0.50	1.50	0.56	0.54	0.080	2850	0.35	0.50	1.50	0.56	0.57	0.096	3420	0.40	0.50	1.50	0.56	0.52
F01.600-104	0.040	1420	0.30	0.40	1.00	0.42	0.48	0.040	1420	0.30	0.40	1.00	0.42	0.44	0.048	1700	0.30	0.40	1.00	0.42	0.46
F01.600-106	0.030	940	0.25	0.40	0.80	0.40	0.46	0.030	940	0.22	0.40	0.80	0.40	0.47	0.036	1130	0.25	0.40	0.80	0.40	0.44
F01.600-108	0.020	720	0.20	0.30	0.60	0.38	0.40	0.020	720	0.20	0.30	0.60	0.38	0.37	0.024	860	0.20	0.30	0.60	0.38	0.38

Notes

The current values shown on the table are referred to motors with Star connection; when the phases are Delta-connected multiply the current figures by factor 1.73

Definitions

- **KW** = motor nominal power
- **RPM** = motor nominal speed in round per minute
- **In** = nominal current of the motor, according to IEC 34-1, which approximately corresponds to 40% of the actuator nominal torque
- **Is** = current which approximately corresponds to the actuator nominal torque (torque set 100%); we recommend the selection of cables and protections based on the above values
- **Icc** = locked rotor current
- **PF** = power factor
- **Eff** = motor efficiency

Motor insulation class H
Motors duty according to IEC 34-1
For ambient temperature up to +65° C: - S2-30 minutes or S4-25%, max 200 starts/hour
For ambient temperature up to +85° C: - S2-15 minutes or S4-25%, max 60 starts/hour

Tolerances

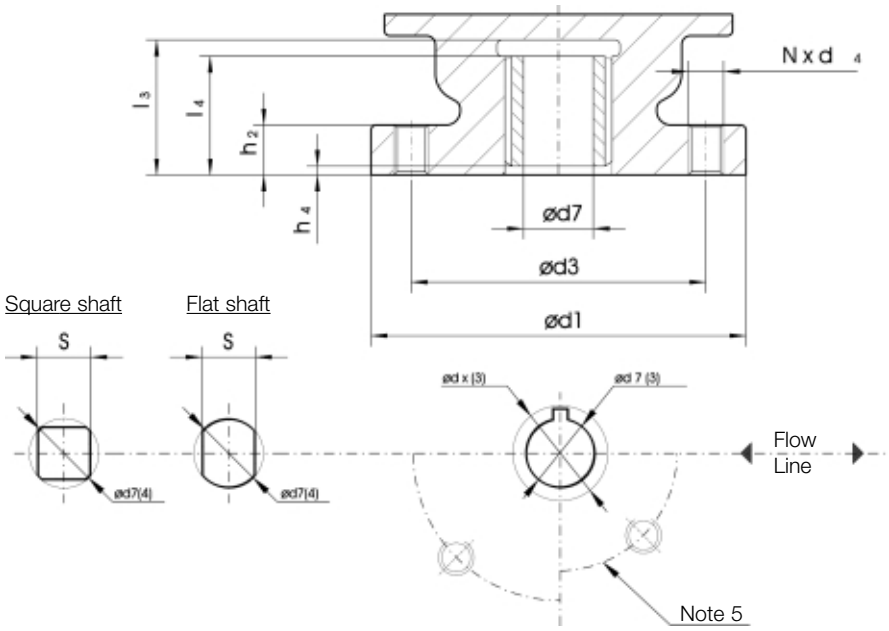
Nominal Voltage Tolerance: ± 6%
Nominal Frequency Tolerance: ± 2%
Momentary max permissible voltage variation: +10%; -15%
Other tolerances according to IEC 34-1

Overall dimensions

Cables entries	a	b	c
NPT #	1"	1" 1/2	1"
ISO Rc 7/1 •	1"	1" 1/2	1"
ISO Metric •	M32x1.5	M40x1.5	M32x1.5
DIN 40430 •	Pg21	Pg29	Pg21

Notes

* = space for cover removal
# = standard version
• = optional version, available on demand
Not certified drawing: certified dimensions will be supplied on request.
All dimensions are in mm



Notes

1. Insert bush supplied by BIFFI with unmachined bore; larger bores can be supplied with solid piece bush
2. Fixing bolts or rods supplied by BIFFI only on request, minimum material required ISO class 8.8
3. dx= the maximum accepted diameter described by the key
4. Position of the shaft with closed valve
5. Additional ISO PCD is provided as shown in column FL

Coupling Dimensions

Actuator	ISO									Max Stem Acceptance				Mass
size	5211	Ø d_1	Ø d_3	Ø d_4	N	l_3	l_4	h_2	h_4	Ø d_7	S	Ø d_x	FL	Kg
F01-150	F10	125	102	M10	4	50	48	16	1	28	22	36	F07	32
F01-300	F10	125	102	M10	4	50	48	16	1	28	22	36	F07	32
F01-600	F12	150	125	M12	4	60	58	18	1	36	30	45	F10	34

1-phase supply at 50 Hz

Model	110V-50Hz-1Ph								230V-50Hz-3Ph							
	KW	RPM	In(A)	Is(A)	Icc(A)	PF	Eff	Cap	KW	RPM	In(A)	Is(A)	Icc(A)	PF	Eff	Cap
F01.150-052	0.040	2820	1.40	2.50	4.50	0.92	0.28	25	0.040	2820	0.70	1.25	2.30	0.92	0.28	6.3
F01.150-054	0.020	1400	0.80	1.50	2.50	0.94	0.24	16	0.020	1400	0.40	0.80	1.30	0.94	0.24	4
F01.150-056	0.014	930	0.60	1.20	2.00	0.97	0.22	12.5	0.014	930	0.30	0.60	1.00	0.97	0.22	3.5
F01.150-058	0.010	700	0.50	0.80	1.50	0.96	0.19	8	0.010	700	0.25	0.40	0.80	0.96	0.19	2
F01.300-052	0.040	2820	1.40	2.50	4.50	0.92	0.28	25	0.040	2820	0.70	1.25	2.30	0.92	0.28	6.3
F01.300-054	0.020	1400	0.80	1.50	2.50	0.94	0.24	16	0.020	1400	0.40	0.80	1.30	0.94	0.24	4
F01.300-056	0.014	930	0.60	1.20	2.00	0.97	0.22	12.5	0.014	930	0.30	0.60	1.00	0.97	0.22	3.5
F01.300-058	0.010	700	0.50	0.80	1.50	0.96	0.19	8	0.010	700	0.25	0.40	0.80	0.96	0.19	2
F01.300-102	0.080	2850	2.10	3.00	5.50	0.90	0.38	50	0.080	2850	1.00	1.50	3.00	0.90	0.40	12.5
F01.300-104	0.040	1420	1.40	2.50	4.50	0.92	0.28	25	0.040	1420	0.70	1.30	2.30	0.92	0.28	6.3
F01.600-102	0.080	2850	2.10	3.00	5.50	0.90	0.38	50	0.080	2850	1.00	1.50	3.00	0.90	0.40	12.5
F01.600-104	0.040	1420	1.40	2.50	4.50	0.92	0.28	25	0.040	1420	0.70	1.30	2.30	0.92	0.28	6.3
F01.600-106	0.030	940	1.20	2.00	3.50	0.94	0.24	20	0.030	940	0.60	1.00	1.80	0.94	0.24	5
F01.600-108	0.020	720	0.80	1.50	2.50	0.94	0.24	16	0.020	720	0.40	0.80	1.30	0.94	0.24	4

1-phase supply at 60 Hz

Model	115V-60Hz-1Ph								240V-60Hz-1Ph							
	KW	RPM	In(A)	Is(A)	Icc(A)	PF	Eff	Cap	KW	RPM	In(A)	Is(A)	Icc(A)	PF	Eff	Cap
F01.150-052	0.048	3380	1.40	2.50	4.50	0.92	0.32	20	0.048	3380	0.70	1.25	2.30	0.92	0.31	6.3
F01.150-054	0.024	1680	0.80	1.50	2.50	0.94	0.28	12.5	0.024	1680	0.40	0.80	1.30	0.94	0.27	4
F01.150-056	0.017	1120	0.60	1.20	2.00	0.97	0.25	10	0.017	1120	0.30	0.60	1.00	0.97	0.24	3.5
F01.150-058	0.012	840	0.50	0.80	1.50	0.96	0.22	6.3	0.012	840	0.25	0.40	0.80	0.96	0.20	2
F01.300-052	0.048	3380	1.40	2.50	4.50	0.92	0.32	20	0.048	3380	0.70	1.25	2.30	0.92	0.31	6.3
F01.300-054	0.024	1680	0.80	1.50	2.50	0.94	0.28	12.5	0.024	1680	0.40	0.80	1.30	0.94	0.27	4
F01.300-056	0.017	1120	0.60	1.20	2.00	0.97	0.25	10	0.017	1120	0.30	0.60	1.00	0.97	0.24	3.5
F01.300-058	0.012	840	0.50	0.80	1.50	0.96	0.22	6.3	0.012	840	0.25	0.40	0.80	0.96	0.20	2
F01.300-102	0.096	3420	2.10	3.00	5.50	0.90	0.44	40	0.096	3420	1.00	1.50	3.00	0.90	0.44	12.5
F01.300-104	0.048	1700	1.40	2.50	4.50	0.92	0.32	20	0.048	1700	0.70	1.30	2.30	0.92	0.31	6.3
F01.600-102	0.096	3420	2.10	3.00	5.50	0.90	0.44	40	0.096	3420	1.00	1.50	3.00	0.90	0.44	12.5
F01.600-104	0.048	1700	1.40	2.50	4.50	0.92	0.32	20	0.048	1700	0.70	1.30	2.30	0.92	0.31	6.3
F01.600-106	0.036	1130	1.20	2.00	3.50	0.94	0.28	16	0.036	1130	0.60	1.00	1.80	0.94	0.27	5
F01.600-108	0.024	860	0.80	1.50	2.50	0.94	0.28	12.5	0.024	860	0.40	0.80	1.30	0.94	0.27	4

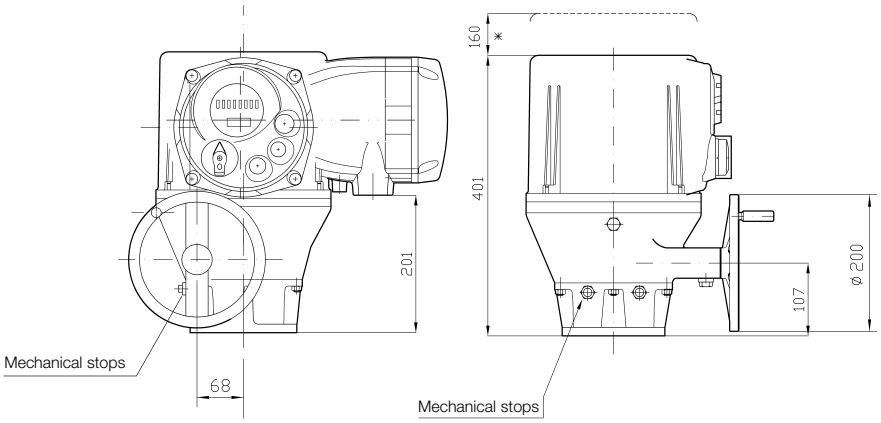
Definitions

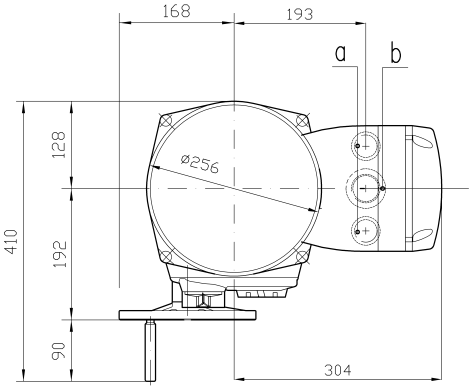
- **KW** = motor nominal power
- **RPM** = motor nominal speed in round per minute
- **In** = nominal current of the motor, according to IEC 34-1, which approximately corresponds to 40% of the actuator nominal torque
- **Is** = current which approximately corresponds to the actuator nominal torque (torque set 100%); we recommend the selection of cables and protections based on the above values
- **Icc** = locked rotor current
- **PF** = power factor
- **Eff** = motor efficiency
- **Cap** = capacitors value measured in microFarad

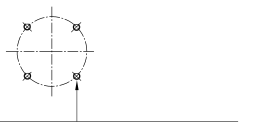
Motor insulation class H
Motors duty according to IEC 34-1
For ambient temperature up to +65° C: S2-30 minutes or S4-25%, max 200 starts/hour
For ambient temperature up to +85° C: S2-15 minutes or S4-25%, max 60 starts/hour

Tolerances

Nominal Voltage Tolerance: ± 6%
Nominal Frequency Tolerance: ± 2%
Momentary max permissible voltage variation: +10%; -15%
Other tolerances according to IEC 34-1







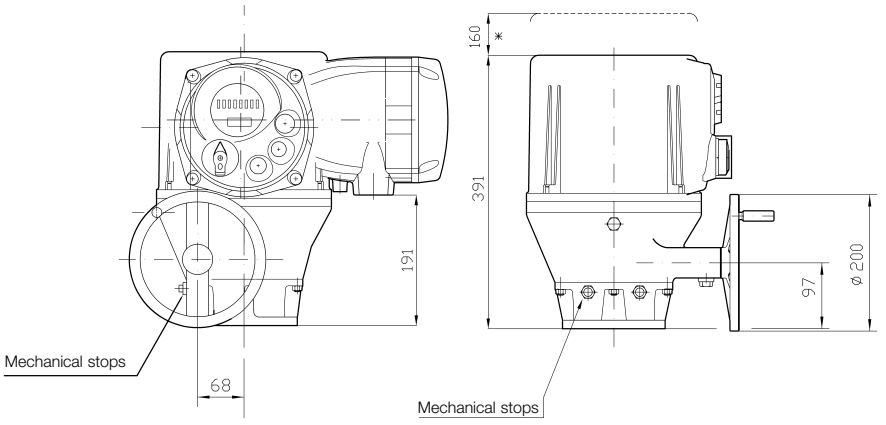
Coupling flange according to ISO 5211 ISOF10/ISOF12

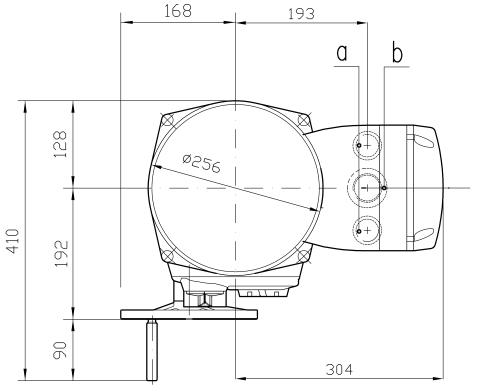
Mass 32 Kg.

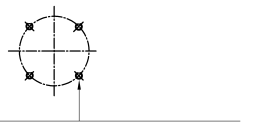
*Space for cover removal

Model F01-600

Overall dimensions			
Cables entries	**a**	**b**	**c**
NTP	1”	1” 1/2	1”







Coupling flange according to ISO 5211 ISOF07/ISOF10

Mass 31 Kg.

*Space for cover removal

Models F01-150 & 300

Overall dimensions			
Cables entries	**a**	**b**	**c**
NTP	1”	1” 1/2	1”