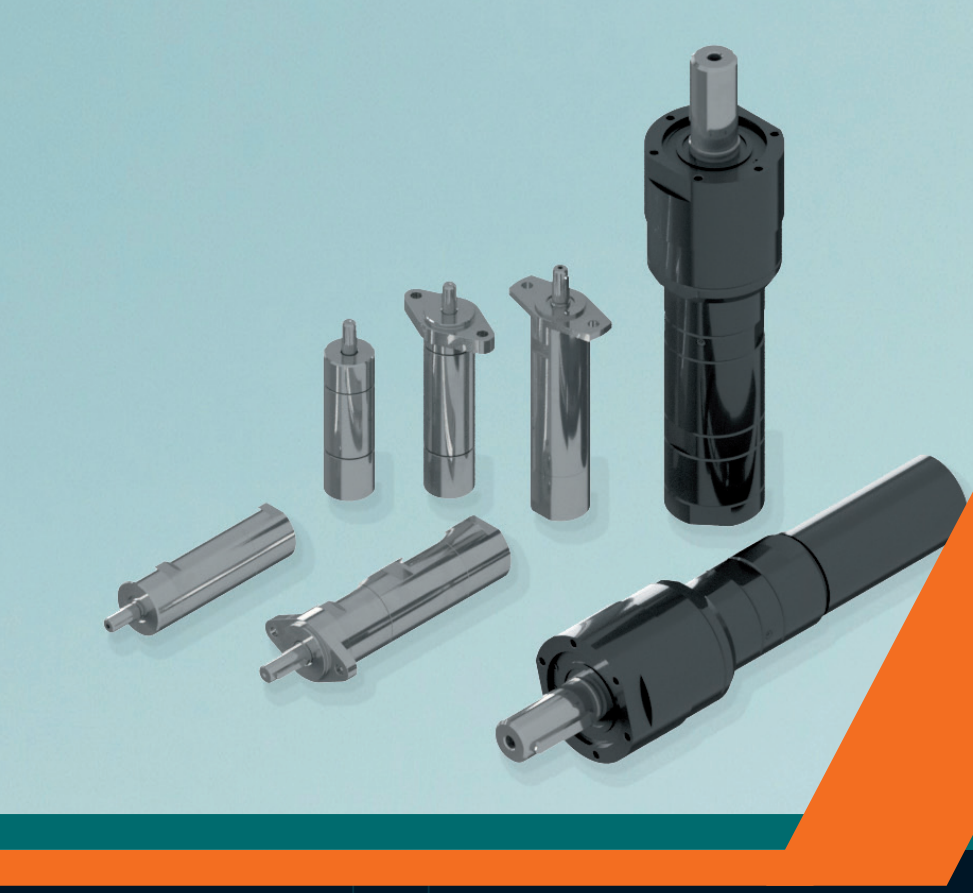


TSA
TECNOLOGIE
SPECIALI
APPLICATE

PNEUMATIC MOTORS

MODULAR AIR MOTORS WITH BLADES

TSA TECNOLOGIE SPECIALI APPLICATE

INDICE

TSA

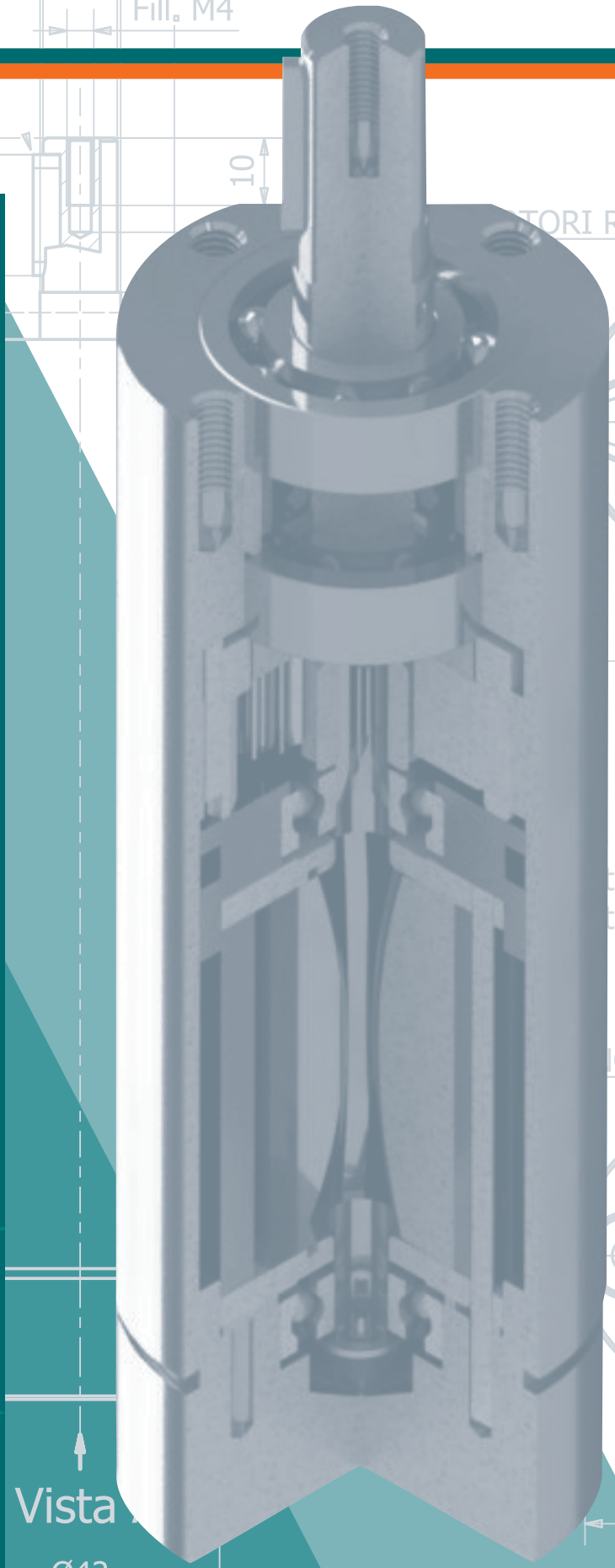
SPECIAL APPLIED TECHNOLOGIES

TSA founded in 1984, for over 30 years has been designing, manufacturing and distributing pneumatic motors, articulated arms for torque reaction, assembling systems and special equipment.

Its technical design office is in charge of studying all of the required characteristics to guarantee maximum reliability and high productivity, according to modern ergonomic principles. Product quality and safety are now a consolidated standard for TSA.

Just-in-time deliveries, a wide, flexible range of products, including diversified motors and arms, an efficient spare parts warehouse and effective before- and after sales: these are the services offered by TSA to its customers. Thanks to its constant commitment and to the professionalism of its technicians,

TSA has gained the trust of major companies on the market. Its aim is to meet customer requirements in all respects: QUALITY, PERFORMANCE AND COST EFFECTIVENESS.



CHARACTERISTICS OF PNEUMATIC MOTORS

The outlet power of a pneumatic motor varies depending on its speed and torque. The performance levels of a pneumatic motor depend on the inlet air pressure level measured at the entry point in the motor; this means that it is sufficient to regulate the incoming air to substantially change the torque and speed values in a pneumatic motor.
The choice of a pneumatic motor is based on three fundamental parameters: POWER, SPEED and TORQUE.

POWER

Pneumatic motors produce a characteristic power curve whose maximum value is obtained at approximately 50% of idle speed. The resulting torque is known as maximum power torque.

SPEED

By idle speed in a pneumatic motor reference is made to a moment when there is no load on the outlet shaft, therefore no torque is produced (moment of force). If the load on the shaft is increased, the speed is reduced in a way which is inversely proportional to the torque.

SPEED

The speed at maximum power is reached when the motor reaches its torque at maximum power.

TORQUE AT MAXIMUM SPEED

The maximum speed torque is reached at approximately 50% of the idle speed of the motor, which equals its maximum power.

STARTING TORQUE

The starting torque is the torque provided by a motor to the loaded shaft when it is started with the maximum air inlet.

STALL TORQUE

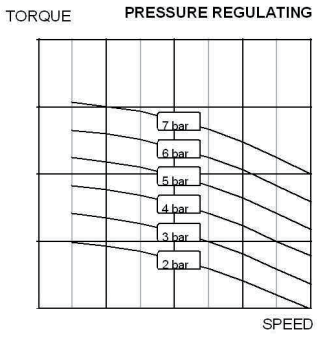
The stall torque is the torque provided by a motor to the shaft during its rotation until it stops completely.

WAYS OF CHANGING THE MOTOR'S PERFORMANCE

The speed and torque in a pneumatic motor can be adjusted by regulating the pressure or throttling the air flow.

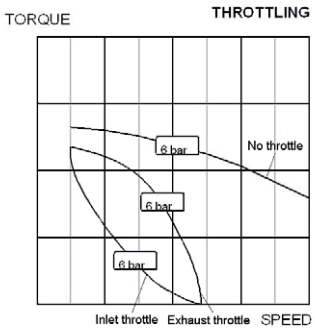
PRESSURE REGULATING

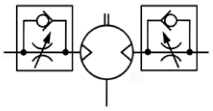
The speed and power can also be reduced by installing a pressure regulator. A pressure regulator, always connected on the entry hole, keeps the inlet air pressure to the motor in check. A pressure regulating system affects the output torque on the shaft, thus making it easier to control the starting torque. If the speed and torque need to be controlled, the best configuration consists in a pressure regulator to the motor inlet and a check valve for the exhaust flow. This means that each point in the speed-torque diagram can be established in a precise way.



FLOW REGULATING

A flow regulator allows adjustment of both the inlet and exhaust flow. It is advisable to work on the exhaust flow in order to achieve a slightly higher starting torque. The diagram shows the difference between these two options.





THROTTLING METHOD
Inlet choking, bi-directional motor

INLET AIR CONDITIONS

CONSUMPTION

The air consumption in a pneumatic motor is proportional to the speed, therefore it reaches its peak at idle speed.
Air consumption is measured in Nl/s, however the conventional unit is l/s.

AIR QUALITY

In order to ensure optimal working conditions for pneumatic motors it is necessary to guarantee the appropriate air inlet and exhaust at all times. In order to ensure its proper operation it is advisable to install an air treatment unit (5-micron filter, regulator and lubricator, unless the motor requires no lubrication), as appropriate for the specific motor.

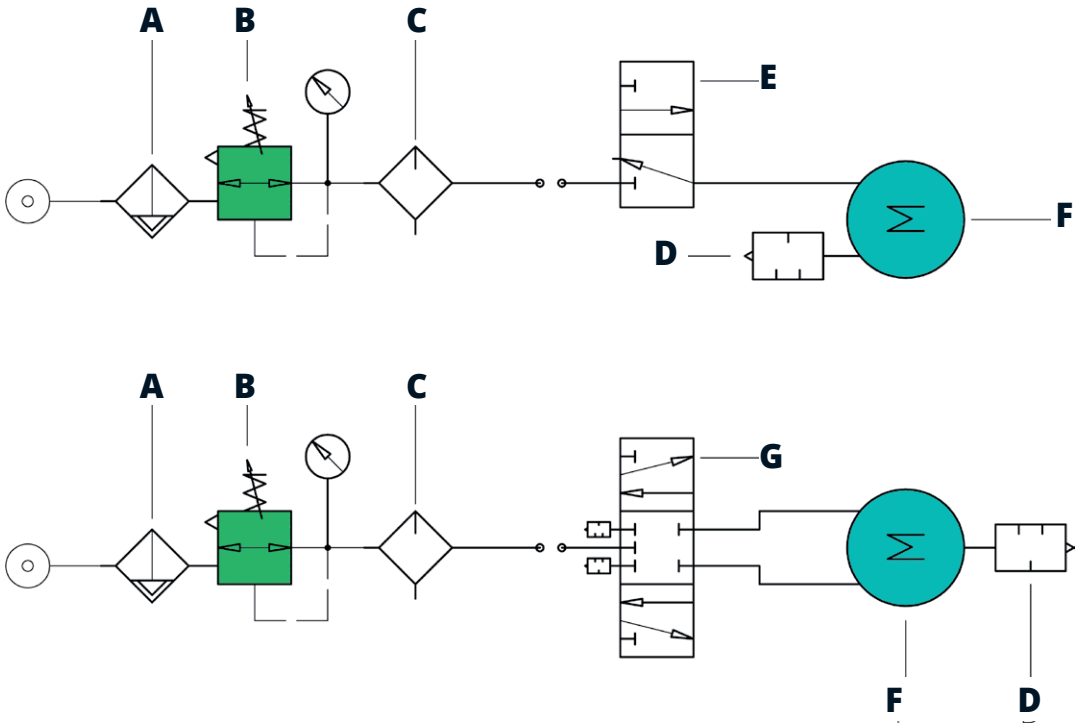
AIR PIPELINE LIMITATIONS

Any limitations in the air inlet line on the motor are bound to reduce its performance levels. Therefore it is especially important to make sure that the required air pressure is available to the motor at all times while it is being operated. Always check the air inlet because if the pipeline is too narrow this might cause a pressure drop. The air exhaust pipe needs to be larger than the inlet pipe. It is advisable to connect the exhaust pipes to a suitable oil separator filter with an incorporated silencer, in order to allow for appropriate lubrication without the room becoming saturated with polluted air.

PNEUMATIC DIAGRAM (POWER – MOTOR CONTROL)

Non-reversible motor operation with 3/2 valve

A = Filter
B = Regulator of pressure
C = Lubricator
D = Silencer
E = 3/2 valve
F = Engine
G = Valve 5/3



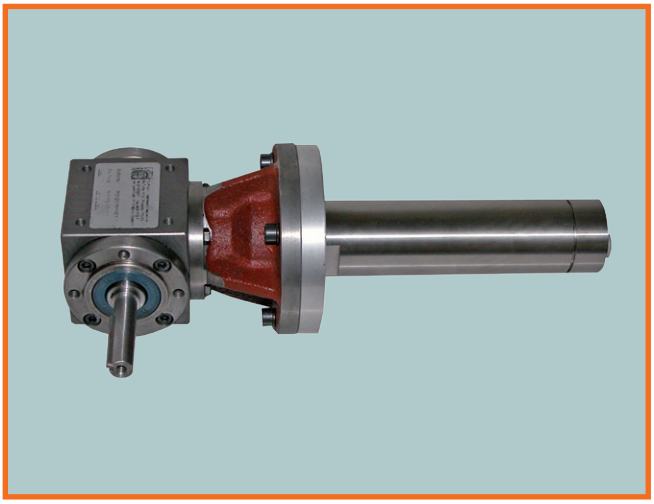
Non-reversible motor operation with 5/3 closed-center valve

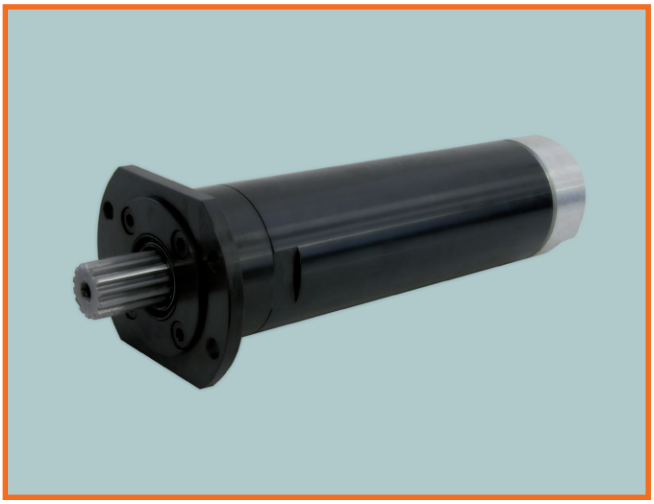
CHARACTERISTICS

Modular Air motors with blades of the M Seriess are strong, reliable and extremely versatile. Use of these motors has numerous advantages compared to electric motors. These include the following: very limited weight and overall size, safe operation, especially if they are used in places where there are flammable substances or in humid environments. There might be application requirements which are so specific that they need special design and construction methods. Therefore TSA makes available for its customers the expertise acquired in this regard, thanks to its Technical Office which is able to develop special applications based on specific customer requirements.

Some of the possible special models are:

- Board output shaft.
- Board output telescopic shaft.
- Threaded shaft.
- Shaft of a different diameter or length compared to the catalogue.
- Special flanges.





ATEX CERTIFICATION

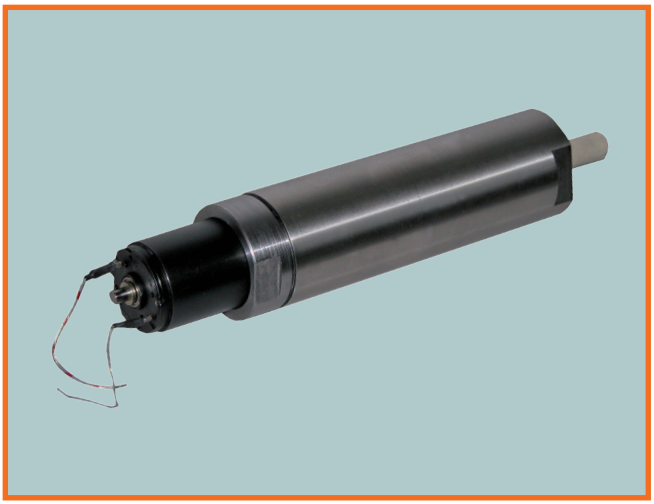
ATEX motors are produced according to 94 / 9 EG (ATEX) for protection equipment and systems to be used in areas where there is a risk of explosion. The following certificates can be provided:

Areas 1 and 2

gas in the atmosphere II 2G c T5 -20°C ≤ TA ≤ +40°C

Areas 21 and 22

dust in the atmosphere II 2 GD c IIC T4 D 135° -20°C ≤ TA ≤ +50°C



STAINLESS STEEL MOTORS

Stainless steel motors are used mainly in the food and chemical industry; they are resistant to cleaning solvents or to corrosive air; all their external parts are made of stainless steel. Il the material used is AISI303 for air inlet, body, seal, flange and shaft.

NO LUBE OPERATION

Most of our motors are available in a NO LUBE version, which means that they do not need lubrication to be operated. In a condition of use with dry air totally without lubricant, the speed of the motor under free conditions may drop over time. Motors in the version without lubricant can in any case be used with lubricated air without being damaged; on the contrary, use with lubrication increases the usable life of the blades. We always recommend to choose a motor that can be used without lubrication and, if the application makes it possible, to power it using lubricated air.

TEMPERATURES

TSA motors are designed to operate at temperatures between -20°C and +80°C; even if the humidity level is relatively high this does not create problems for the motor. In case of operation at low temperatures, it is possible that ice might form in the air exhaust area, but this has no effect in terms of performance.

OVERLOADING

If motors that are not resistant to stalling are to be used, we recommend adding a safety joint. It is mandatory to use the latter in application where there is a probability of the motor stalling.

ORDER CODE

Rotation
R - Reversible
N - Non-reversible (right-hand rotation)

Reduction ratio
0 – 1 - 2 – 3 - 4
1A – 1B –1C – 1D
2A – 2B – 2C – 2D
3A – 3B – 3C – 3D
4A – 4B – 4C – 4D

Output flange
X - Without flange
F - Fixing flange

N
No Lube Standard

N - M - 53 - R - 1A - 051 - X

M
Pneumatic motor

Engine Size
9 - 0,13 KW / 0,17 hp *
12 - 0,20 KW / 0,26 hp *
16 - 0,16 KW / 0,21 hp
23 - 0,23 KW / 0,30 hp
25 - 0,25 KW / 0,33hp
40 - 0,50 KW / 0,67 hp *
53 - 0,38 KW / 0,53 hp
62 - 0,62 KW / 0,83 hp +
82 - 0,82 KW / 1 hp +
84 - 0,84 KW / 1,1 hp +
120 - 1,2 KW / 1,6 hp +
400 - 2,9 KW / 4 hp +

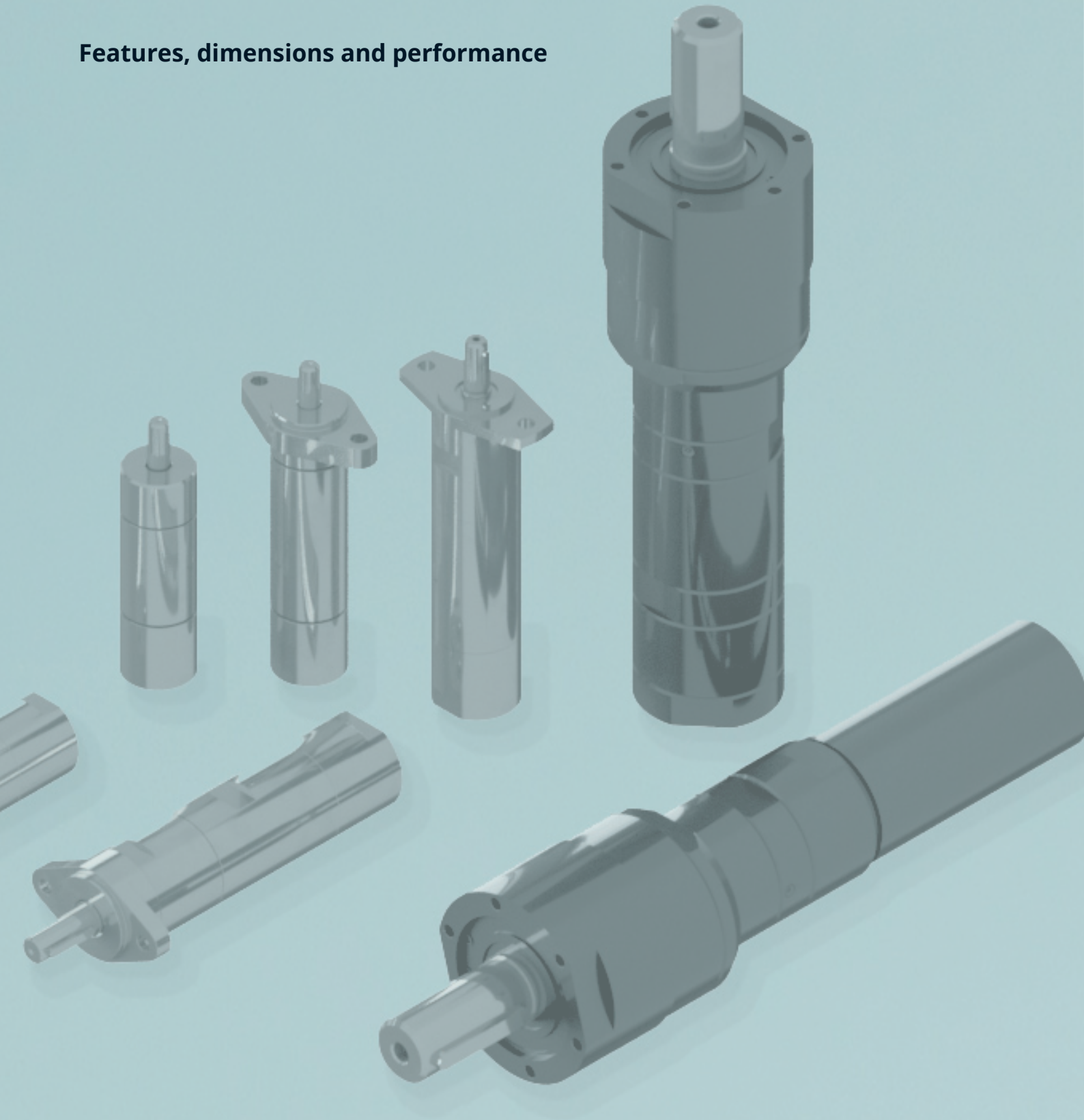
Changes
051 - Stainless steel shaft
015 - Counter-clockwise rotation
019 - Projecting bearing
102 - IrReversiblety device

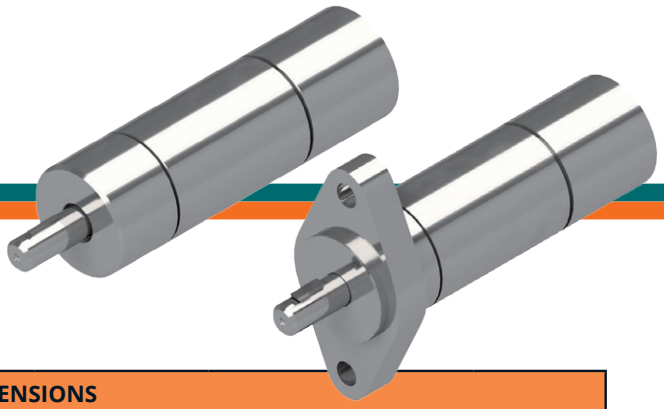
*** No lube version not available on this model.**
+ Version not available in stainless steel.

There might be application requirements which are so specific that special design and construction methods are called for. This is why TSA makes available for its customers the experience it has acquired in this regard, thanks to its Technical Office which is able to develop special applications based on specific customer requirements.

MODULAR AIR MOTORS WITH BLADES

Features, dimensions and performance





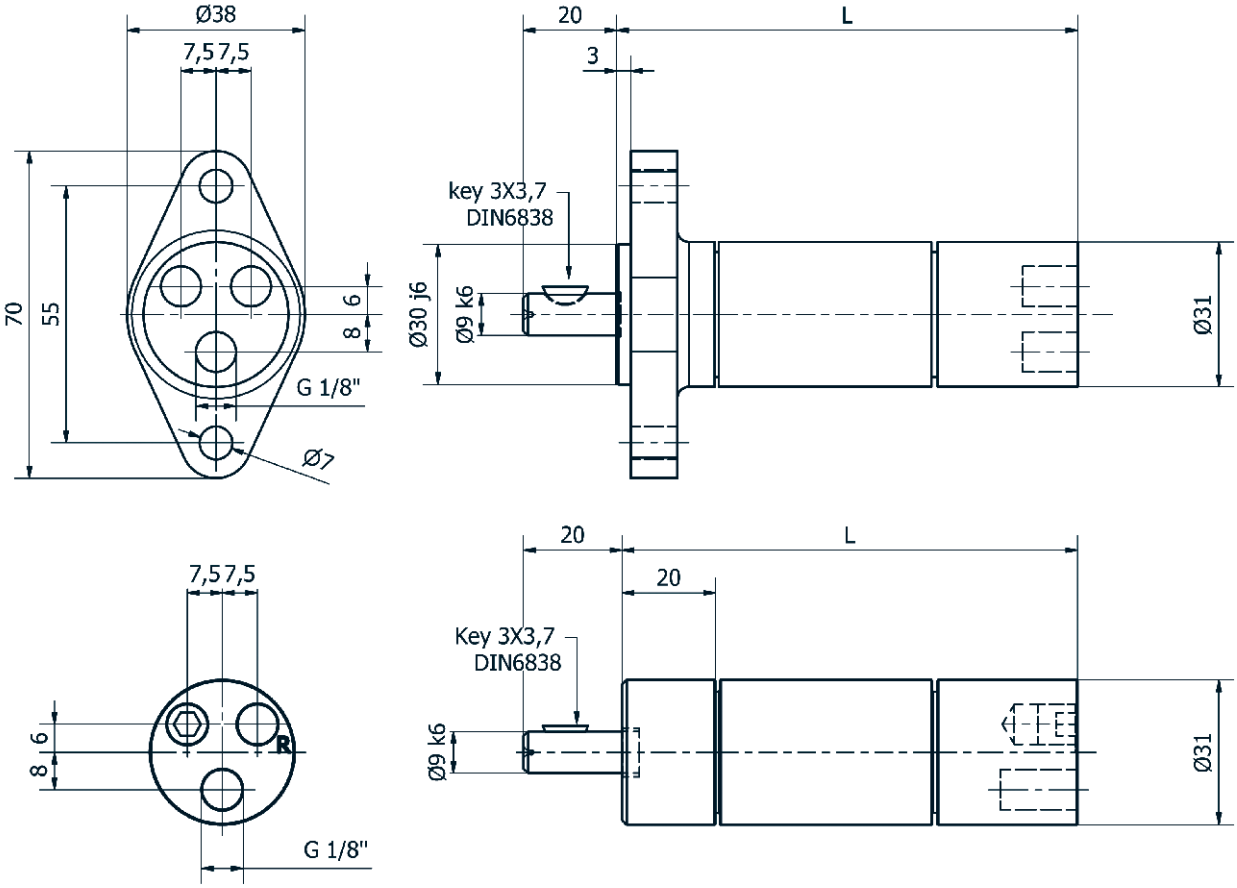
SERIES M9..... - HP 0,17 KW 0,13

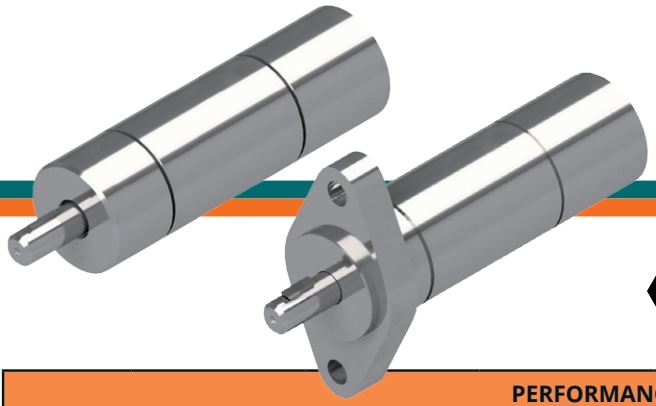
PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0.17	HP 0.17	HP 0.17	HP 0.17	HP 0.17			
M9R1	4600	2300	0.54	0.81	1.1	100	0.45	4.9
M9R1A	2600	1300	0.95	1.4	1.9	100	0.45	4.9
M9R1B	1120	560	2.2	3.3	4.4	126	0.57	4.9
M9R1C	660	330	3.8	5.6	7.5	126	0.57	4.9
M9R1D	400	200	6.2	9.3	12	126	0.57	4.9

AVAILABLE VERSIONS
F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE
N - No lube
N - Non-reversible (right-hand rotation)
S - Non-reversible (counterclockwise rotation)

Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 700 N max
Axial load: 600 N max
Temperature operating: da -20°C a +80°C





TSA TECNOLOGIE SPECIALI APPLICATE

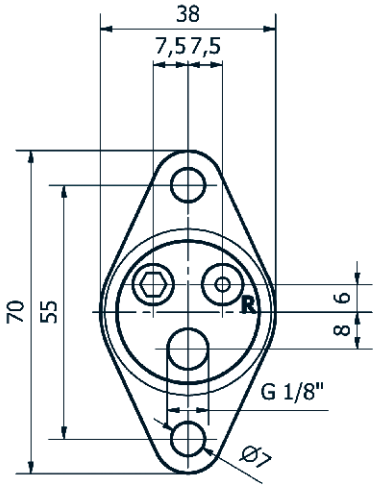
SERIES M12..... - HP 0,26 KW 0,20

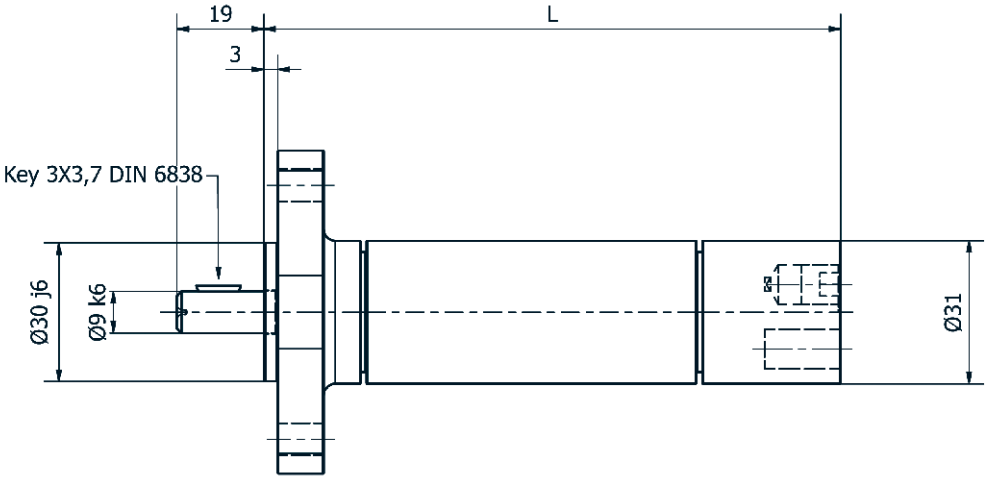
PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0.26	HP 0.26	HP 0.26	HP 0.26	HP 0.26			
M12N1	6500	3250	0.58	0.87	1.2	100	0.38	5.6
M12N1A	3800	1900	1	1.5	2	100	0.38	5.6
M12N1B	1620	810	2.4	3.5	4.7	126	0.52	5.6
M12N1C	960	480	4	6	8	126	0.52	5.6
M12N1D	560	280	6.8	10	14	126	0.52	5.6

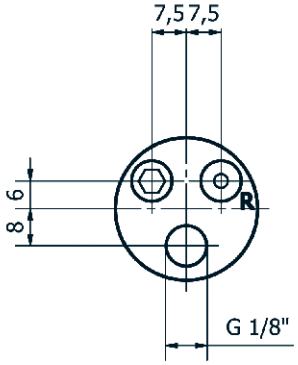
AVAILABLE VERSIONS
F - Flange fixing
A - Atex Certification

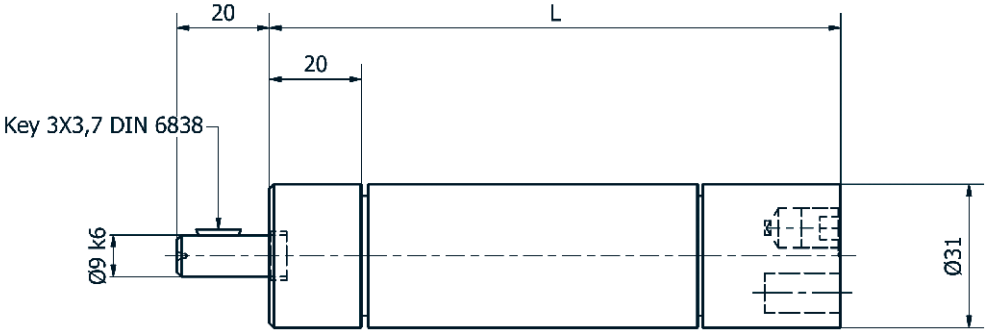
VERSIONS NOT AVAILABLE
N - No lube
N - Non-reversible (right-hand rotation)
S - Non-reversible (counterclockwise rotation)

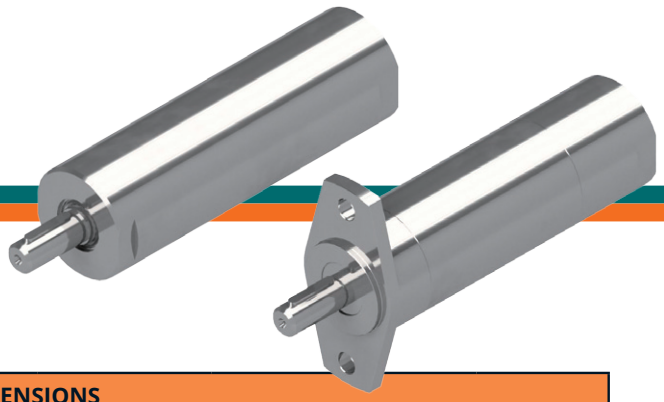
Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 700 N max
Axial load: 600 N max
Temperature operating: da -20°C a +80°C











SERIES M16..... - HP 0,21 KW 0,16

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0,21	HP 0,21	HP 0,21	HP 0,21	HP 0,21			
M16R1	13000	6500	0.24	0.36	0.48	114	0.65	5
M16R1A	2800	1400	1.1	1.7	2.2	114	0.65	5
M16R1B	2100	1050	1.5	2.3	3.0	114	0.65	5
M16R1C	1300	650	2.4	3.6	4.8	114	0.65	5
M16R1D	620	310	5.0	7.5	10	145	0.85	5
M16R2A	480	240	6.7	10	13	145	0.85	5
M16R2B	280	140	11	16	22	145	0.85	5

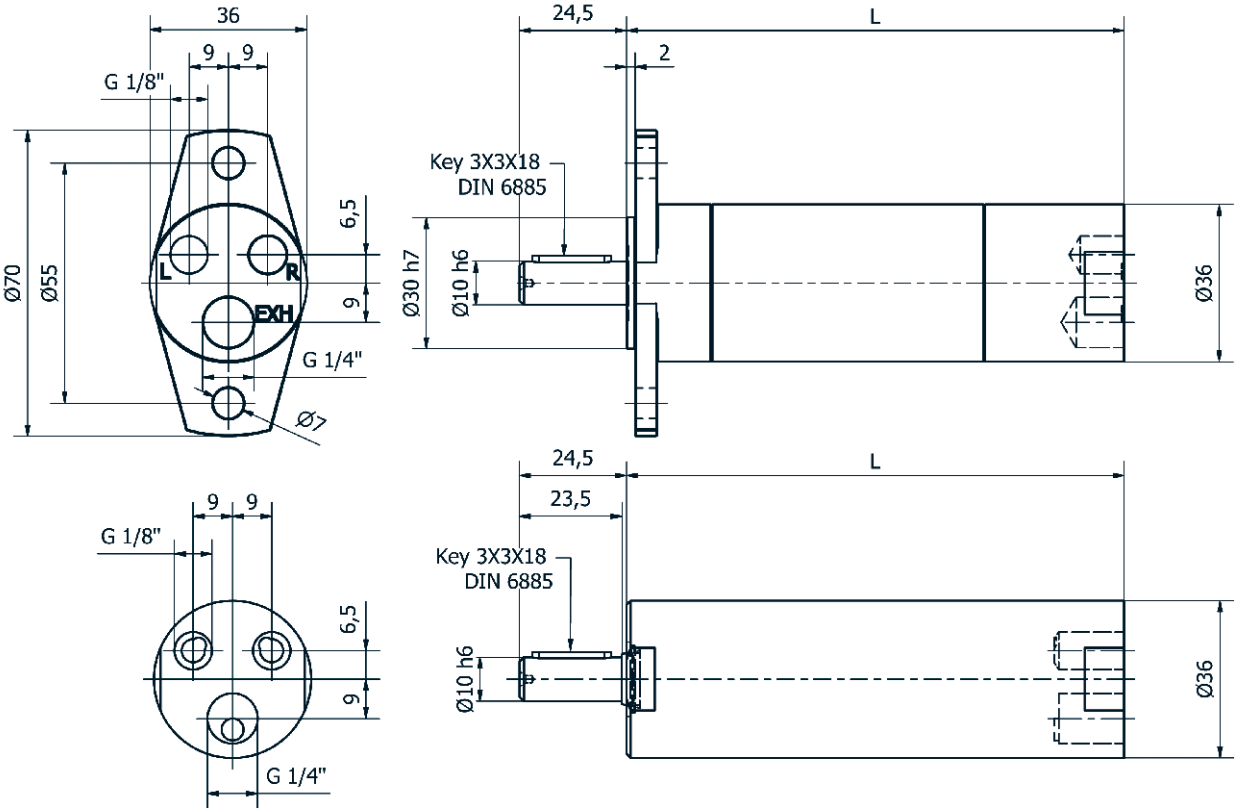
AVAILABLE VERSIONS

F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE

N - No lube
N - Non-reversible (right-hand rotation)
S - Non-reversible (counterclockwise rotation)

Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 1100 N max
Axial load: 900 N max
Temperature operating: da -20°C a +80°C



SERIES M23..... - HP 0,30 KW 0,23

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0.26	HP 0.26	HP 0.26	HP 0.26	HP 0.26			
M23R1	14000	7000	0.31	0.46	0.62	120	0.90	7.8
M23R1A	3920	1960	1.1	1.7	2.2	120	0.90	7.8
M23R1B	2180	1090	2	3	4	120	0.90	7.8
M23R1C	1760	880	2.5	3.8	5	120	0.90	7.8
M23R1D	870	435	5	7.5	10	152.5	1.20	7.8
M23R2	480	240	9.2	14	18	152.5	1.20	7.8
M23R2A	380	190	12	17	23	152.5	1.20	7.8
M23R2B	240	120	18	27	37	152.5	1.20	7.8
M23R2C	140	70	32	47	63	203.5	2.6	7.8
M23R2D	110	55	40	60	80	203.5	2.6	7.8
M23R3	80	40	55	83	110	203.5	2.6	7.8
M23R3A	60	30	74	110	147	203.5	2.6	7.8
M23R3B	50	25	88	132	176	203.5	2.6	7.8
M23R3C	40	20	110	165	220	322	5	7.8
M23R3D	30	15	147	220	293	322	5	7.8
M23R4	20	10	220	330	440	322	5	7.8
M23R4A	14	7	313	469	626	322	5	7.8

AVAILABLE VERSIONS

N - No lube
F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE

N - Non-reversible (right-hand rotation)
S - Non-reversible (counterclockwise rotation)

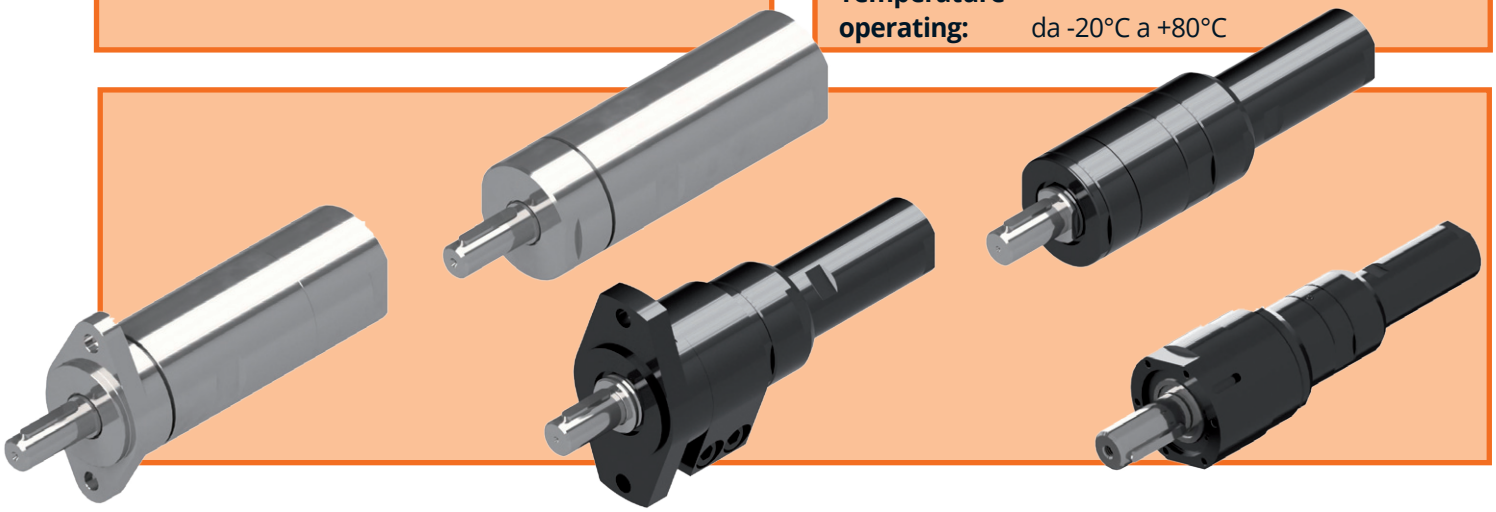
Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service

Filtration: 64 µ or better

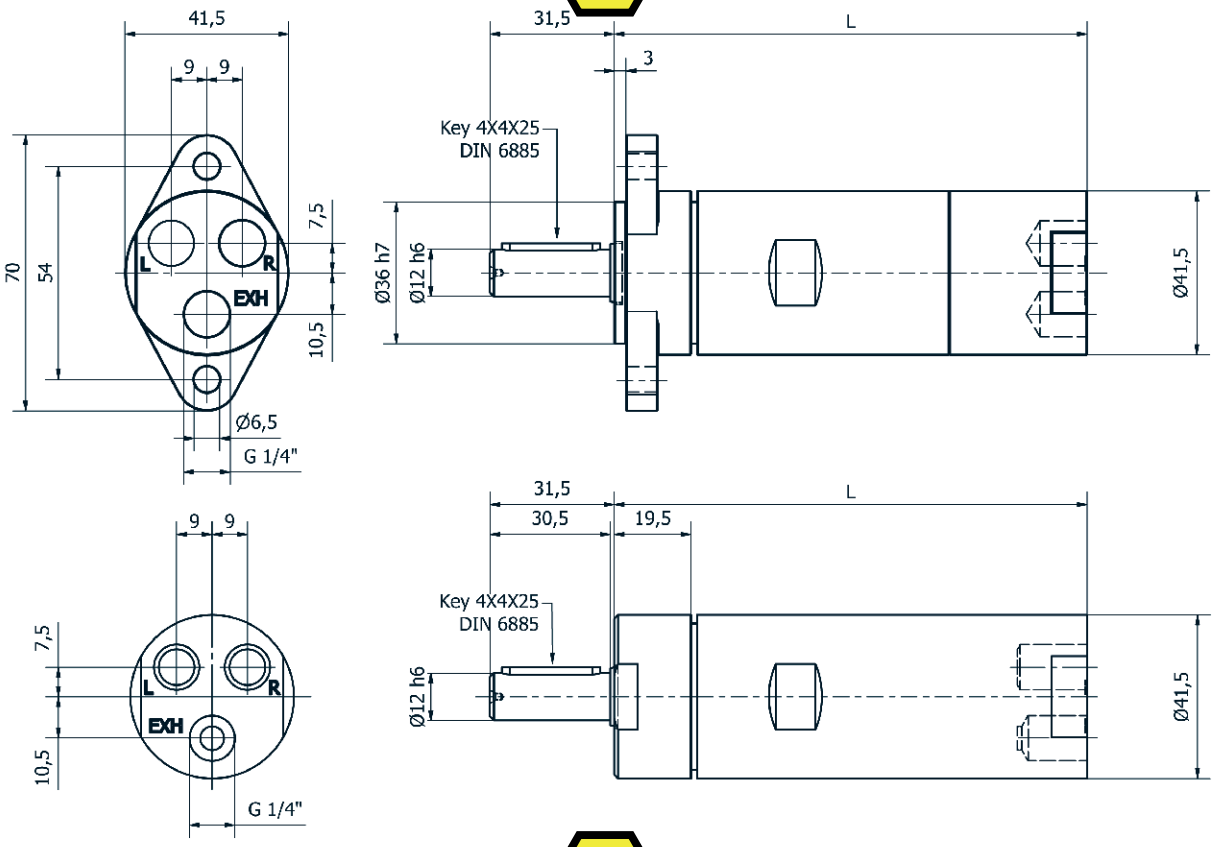
Radial load: 1300 N max da R1 a R2B
3900 N max da R2C a R4A

Axial load: 1000 N max da R1 a R2B
1800 N max da R2C a R4A

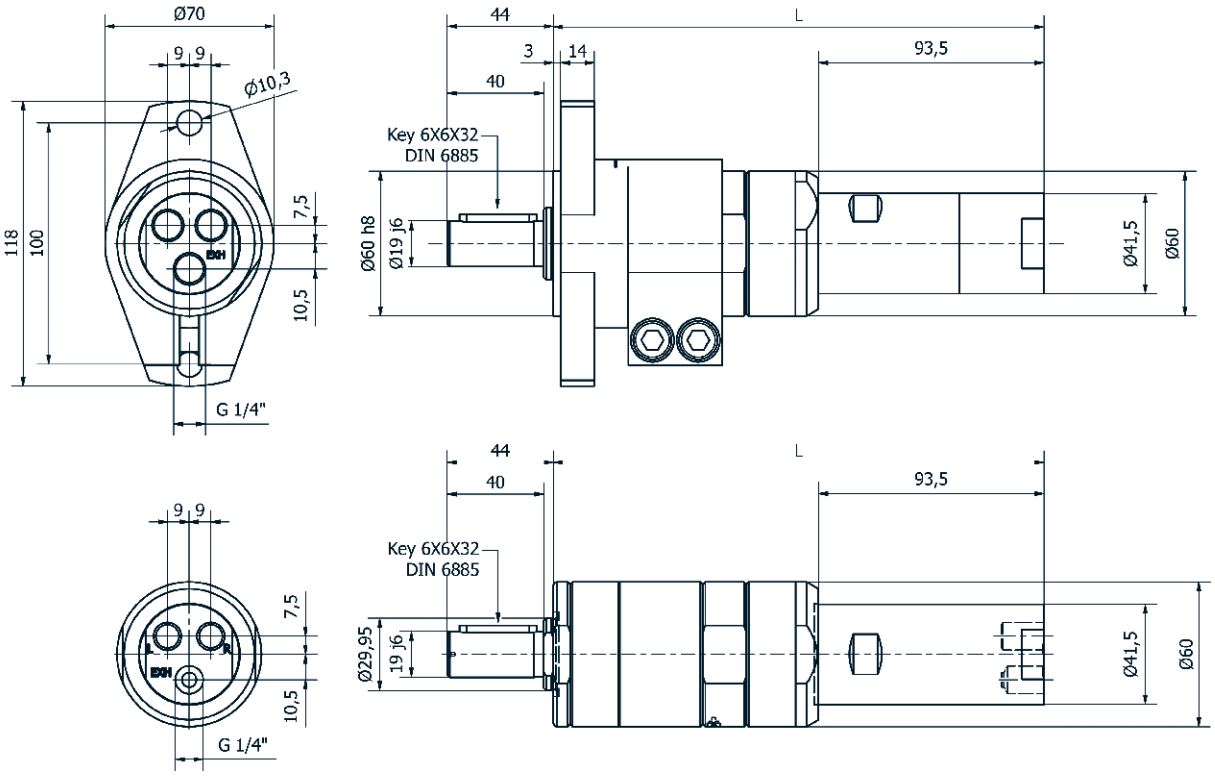
Temperature operating: da -20°C a +80°C



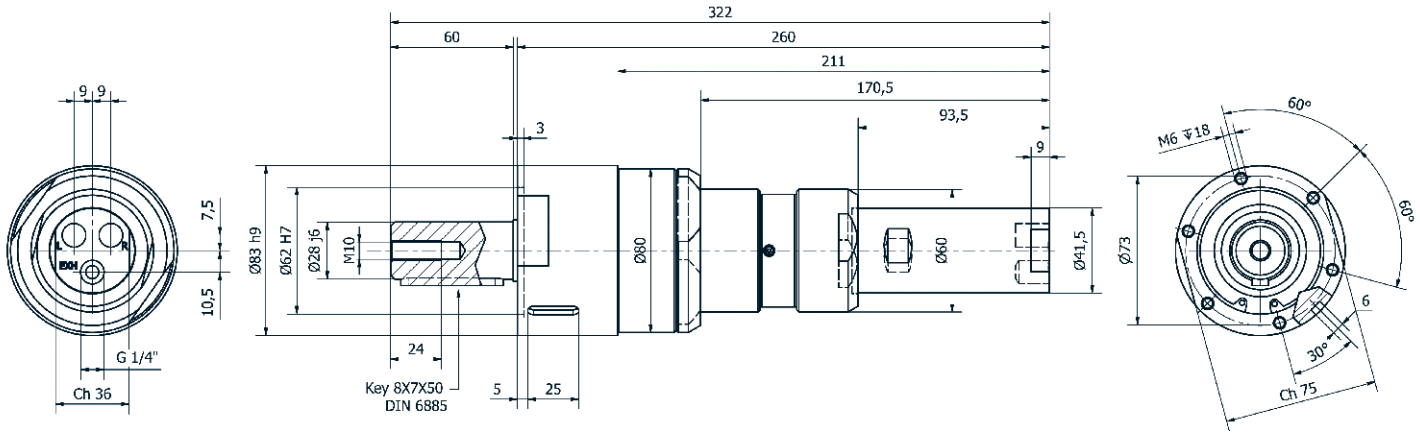
MODELS DA M23R1 A M23R2B

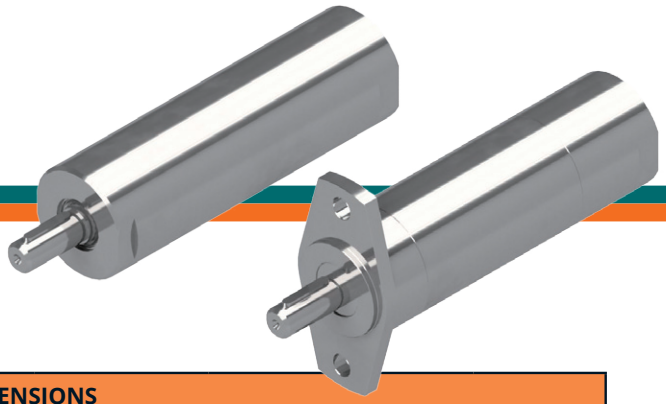


MODELS DA M23R2C A M23R3B



MODELS DA M23R3D A M23R4A





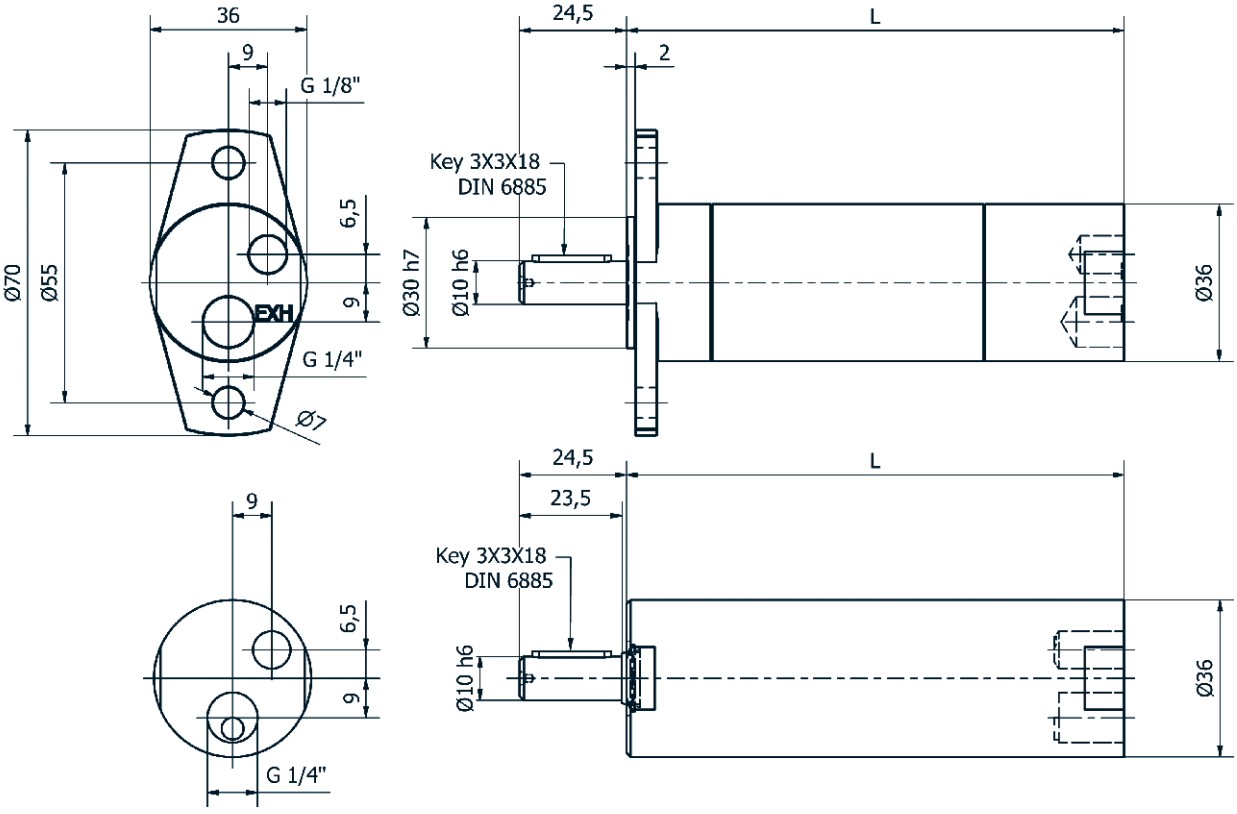
SERIES M25..... - HP 0,33 KW 0,25

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0,33	HP 0,33	HP 0,33	HP 0,33	HP 0,33			
M25N1	19200	9600	0.25	0.38	0.50	114	0.65	5
M25N1A	4400	2200	1.1	1.7	2.2	114	0.65	5
M25N1B	3300	1650	1.5	2.3	3	114	0.65	5
M25N1C	2080	1040	2.4	3.6	4.8	114	0.65	5
M25N1D	1070	535	4.3	6.5	8.6	145	0.85	5.3
M25N2	760	380	6	9	12	145	0.85	5.3
M25N2A	470	235	10	15	20	145	0.85	5.3

AVAILABLE VERSIONS
N - No lube
F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE
R - Reversible

Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 1100 N max
Axial load: 900 N max
Temperature operating: da -20°C a +80°C



SERIES M40..... - HP 0,67 KW 0,50

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0.67	HP 0.67	HP 0.67	HP 0.67	HP 0.67			
M40R1	19000	9500	0.50	0.75	1	137.2	1.40	12.6
M40R1A	4800	2400	2	3	4	137.2	1.70	12.6
M40R1B	3400	1700	2.8	4.2	5.6	137.2	1.70	12.6
M40R1C	3000	1500	3.2	4.8	6.4	137.2	1.70	12.6
M40R1D	1150	575	8.3	12	17	137.2	1.70	12.6
M40R2	860	430	11	17	22	175.4	2	12.6
M40R2A	710	355	13	20	27	175.4	2	12.6
M40R2B	530	265	18	27	36	175.4	2	12.6
M40R2C	440	220	22	33	43	175.4	2	12.6
M40R2D	180	90	53	80	106	234.5	5.5	12.6
M40R3	130	65	73	110	146	234.5	5.5	12.6
M40R3A	80	40	119	179	238	234.5	5.5	12.6
M40R3B	40	20	238	357	476	291	5.5	12.6
M40R3C	28	14	341	512	682	291	5.5	12.6

AVAILABLE VERSIONS
N - No lube
F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE
N - Non-reversible (right-hand rotation)
S - Non-reversible (counterclockwise rotation)

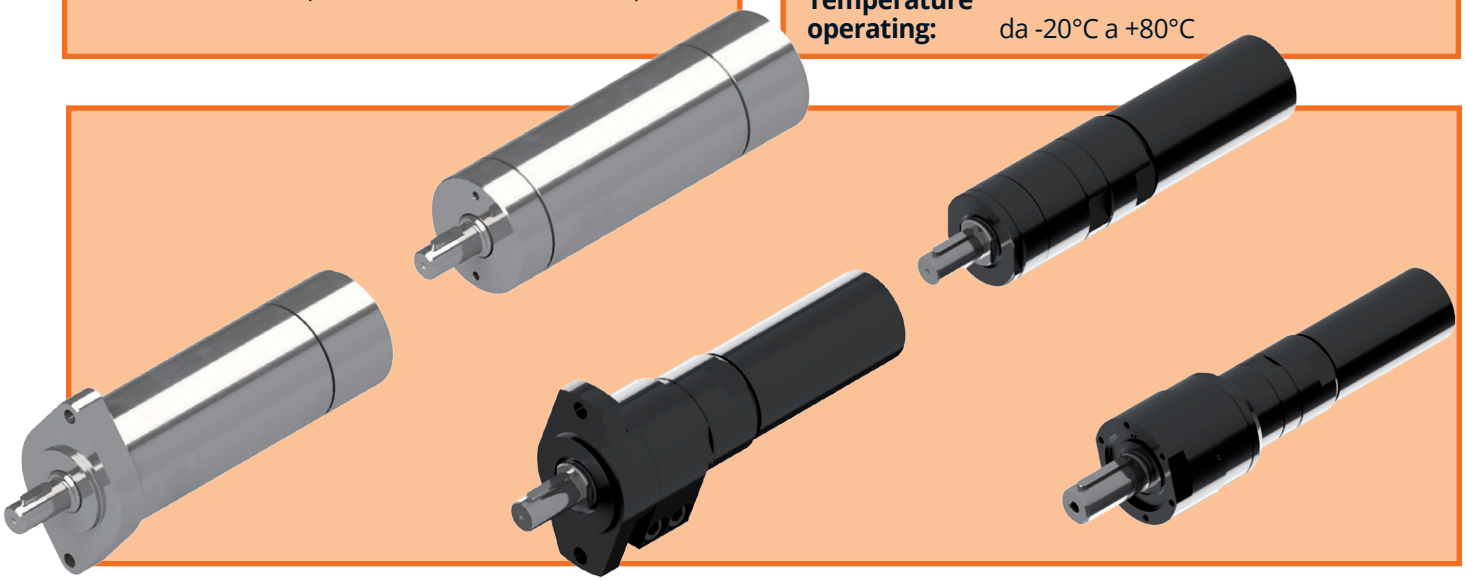
Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service

Filtration: 64 µ or better

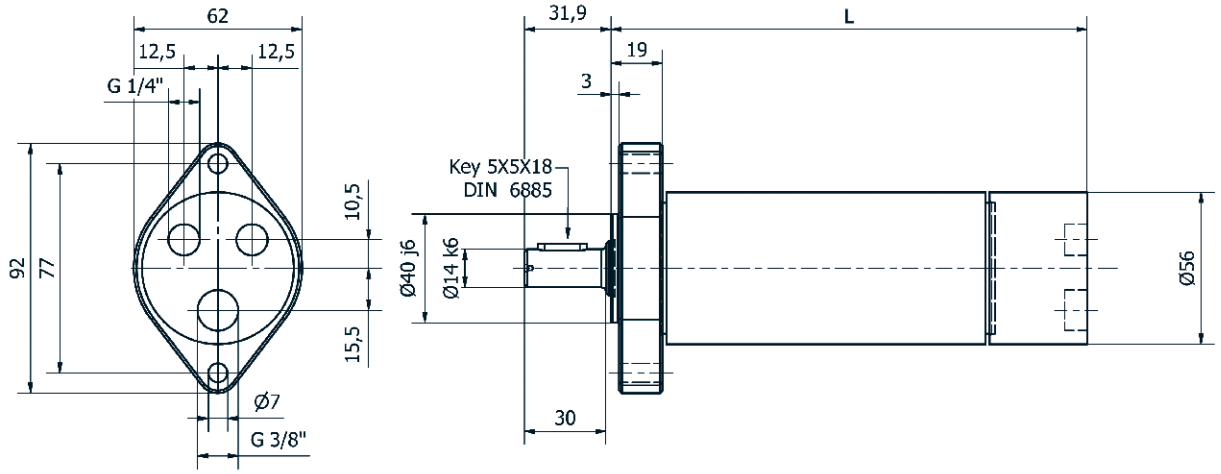
Radial load: 2100 N max da R1 a R2C
3900 N max da R2D a R3C

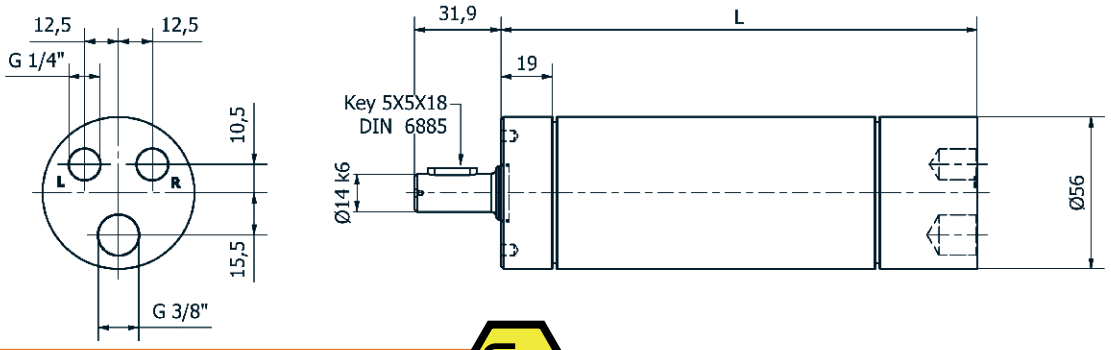
Axial load: 1500 N max da R1 a R2C
1800 N max da R2D a R3C

Temperature operating: da -20°C a +80°C

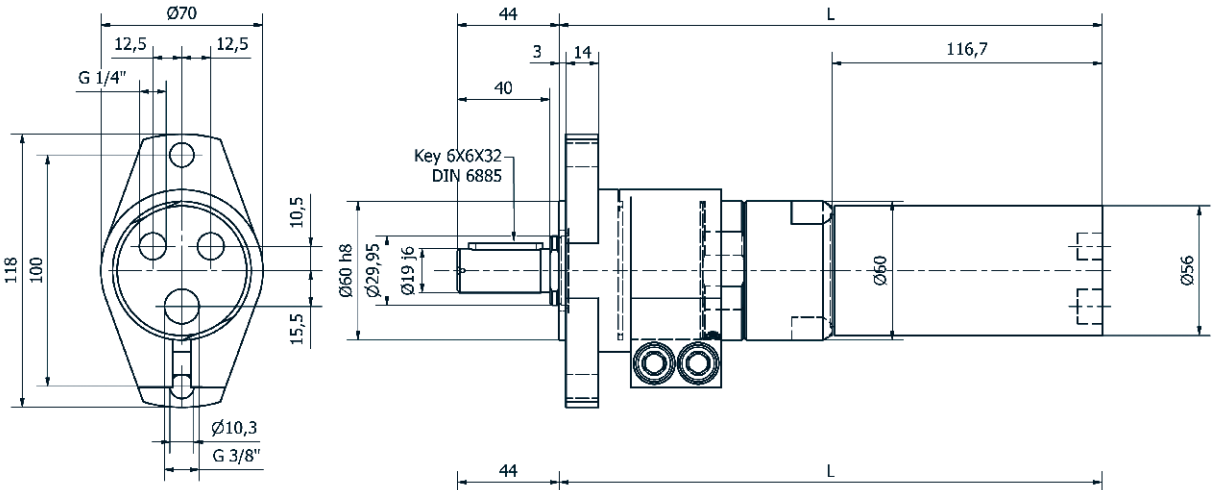


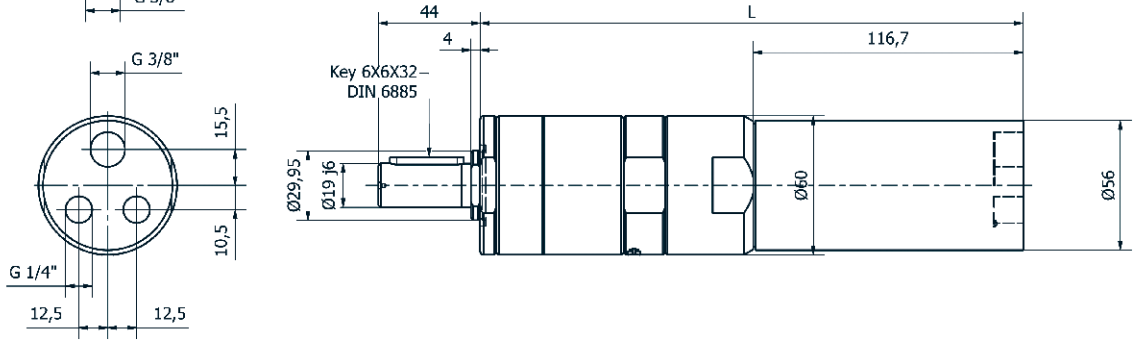
MODELS DA M40R1 A M40R2C



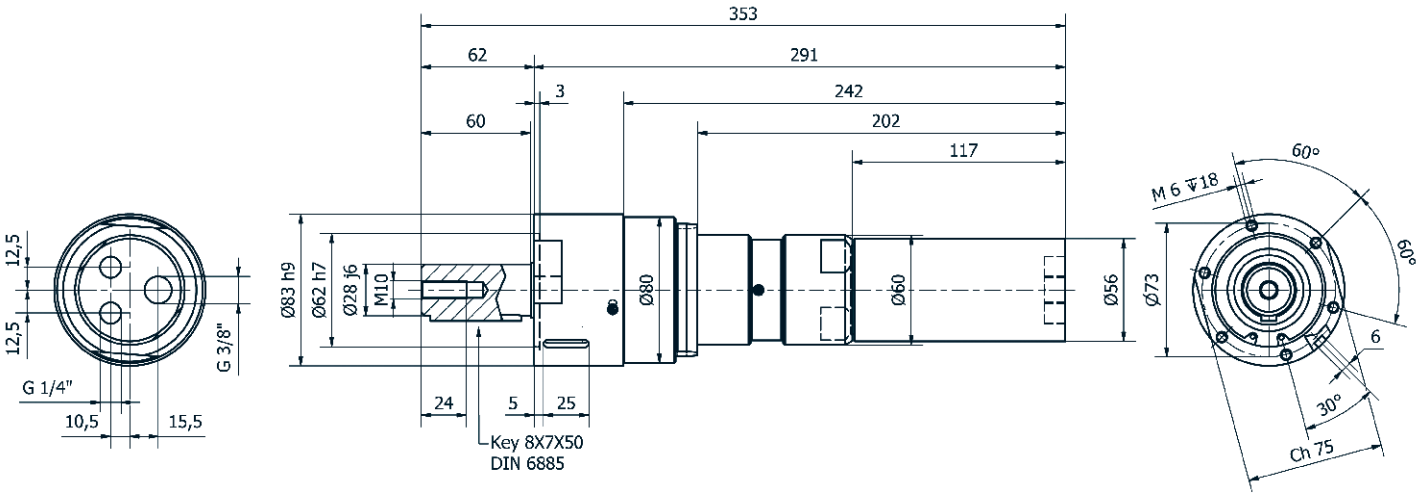


MODELS DA M40R2D A M40R3A





MODELS DA M40R3B A M40R3C



SERIES M53..... - HP 0,53 KW 0,38

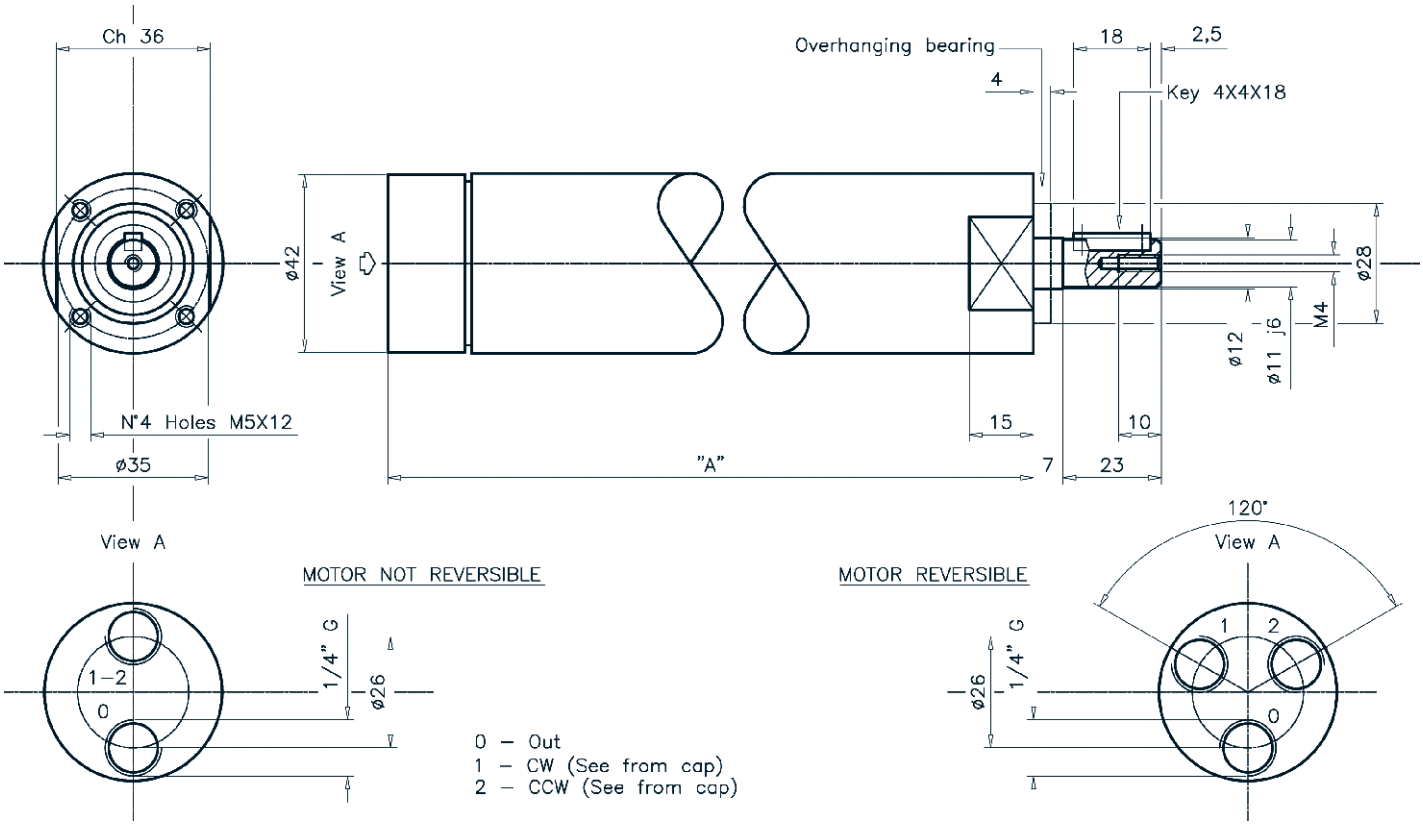
PERFORMANCE AND DIMENSIONS																			
MODEL		Free Speed-RPM			Speed at maximum Power Speed-RPM			Coppia alla massima potenza Nm			Torque at the cue nm			Stall torque Nm			Quota "A" mm	Weight Kg.	N° Stadi di riduzione
Reversible	Non Reversible	7 bar HP 0,53	5 bar HP 0,35	3 bar HP 0,15	7 bar HP 0,53	5 bar HP 0,35	3 bar HP 0,15	7 bar HP 0,53	5 bar HP 0,35	3 bar HP 0,15	7 bar HP 0,53	5 bar HP 0,35	3 bar HP 0,15	7 bar HP 0,53	5 bar HP 0,35	3 bar HP 0,15			
M53R0	M53N0	15000	13400	11800	7500	6700	5900	0,5	0,3	0,1	0,6	0,4	0,2	0,9	0,6	0,3	118	0,9	0
M53R1A	M53N1A	3800	3400	3000	1900	1700	1500	1,9	1,4	0,7	2,9	1,8	1,0	3,9	2,8	1,4	118	0,9	1
M53R1B	M53N1B	2800	2550	2250	1400	1275	1125	2,6	1,9	0,9	3,9	2,8	1,3	5,2	3,8	1,8	118	0,9	1
M53R1C	M53N1C	2400	2180	1930	1200	1090	965	3,0	2,2	1,1	4,5	3,3	1,6	6,0	4,4	2,2	118	0,9	1
M53R1D	M53N1D	2100	1900	1690	1050	850	845	3,5	2,4	1,2	5,2	4,2	1,8	7,0	5,6	2,4	118	0,9	1
M53R2	M53N2	1200	1000	900	600	500	450	6,3	4,8	2,3	9,6	6,0	3,3	13	9,3	4,7	135	1,0	2
M53R2A	M53N2A	900	755	670	450	377	335	8,0	6,3	3,1	12	9,4	4,6	16	13	6,2	135	1,0	2
M53R2B	M53N2B	630	565	500	315	282	230	11	8,4	4,2	17	13	6,3	23	17	8,4	135	1,0	2
M53R2C	M53N2C	540	485	430	270	242	215	13	10	4,9	19	15	7,3	26	20	9,8	135	1,0	2
M53R2D	M53N2D	480	425	375	240	212	187	15	11	5,6	22	16	8,4	30	22	11	135	1,0	2
M53R3	M53N3	270	220	200	135	110	100	27	20	10	40	31	15	53	41	21	157	1,2	3
M53R3A	M53N3A	190	168	150	85	84	75	42	28	14	63	42	21	84	56	28	157	1,2	3
M53R3B	M53N3B	140	126	110	70	63	55	51	38	19	75	57	28	102	76	38	157	1,2	3
M53R3C	M53N3C	120	108	95	60	54	48	60	44	22	90	66	33	120	88	44	157	1,2	3
M53R3D	M53N3D	110	95	83	55	47	42	65	50	25	97	75	37	130	100	50	157	1,2	3
M53R4	M53N4	60	50	45	30	25	22	140	93	47	210	140	70	280	185	93	175	1,3	4
M53R4A	M53N4A	46	37	33	23	19	16	157	125	65	235	187	97	315	250	130	175	1,3	4
M53R4B	M53N4B	32	28	24	16	14	12	230	170	87	345	255	145	460	340	194	175	1,3	4
M53R4C	M53N4C	26	24	21	13	12	10	277	198	105	410	297	157	550	396	210	175	1,3	4
M53R4D	M53N4D	23	21	18	11	10	9	328	238	117	485	357	175	650	476	234	175	1,3	4

ATTENTION

The motors of the M53 series can not be submitted to resistant torques over 60 Nm Admitting values in the colored field of green are to be considered purely indicative

Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 2000 N max
Axial load: non ammesso
Temperature operating: da -20°C a +80°C

Consumption aria	a 7 bar 8,6 l/sec	a 6 bar 7,4 l/sec.	a 5 bar 6,2 l/sec	a 4 bar 5,1 l/sec	a 3 bar 3,8 l/sec	a 2 bar 2,4 l/sec



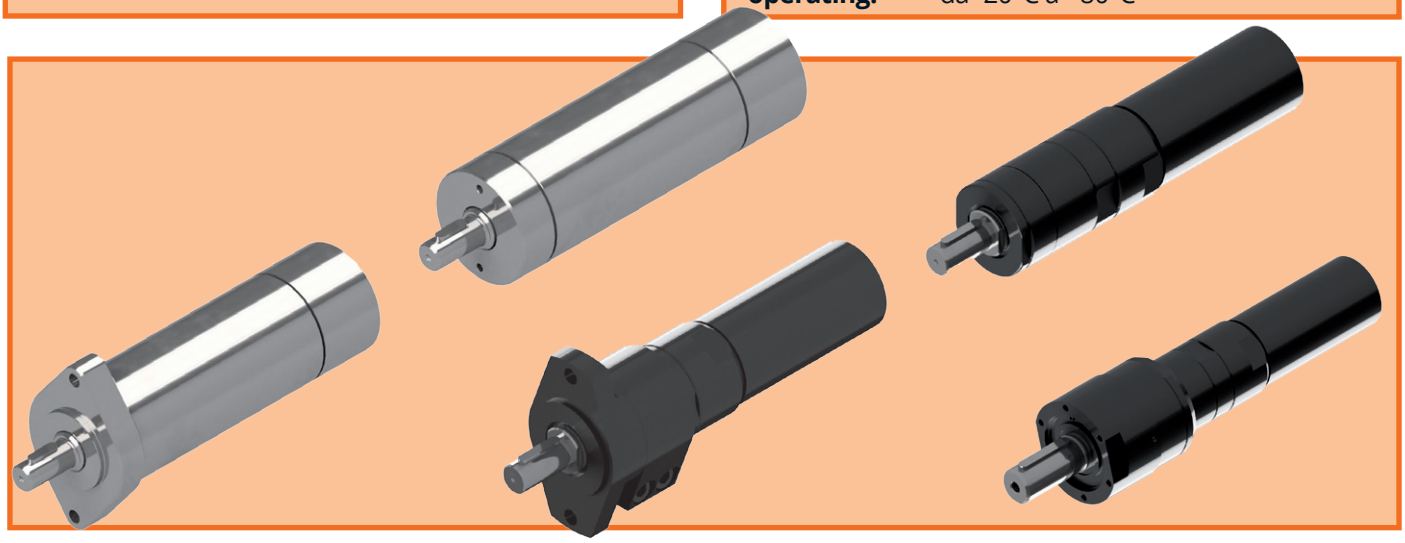
SERIES M55..... - HP 0,83 KW 0,62

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0,83	HP 0,83	HP 0,83	HP 0,83	HP 0,83			
M55N1	22000	11000	0.54	0.81	1.1	137	1	14.6
M55N1A	5600	2800	2.1	3.2	4.2	137	1.4	14.6
M55N1B	4400	2200	2.7	4.0	5.4	137	1.40	14.6
M55N1C	3600	1800	3.3	4.9	6.6	137	1.40	14.6
M55N1D	1300	650	9.1	14	18	175.5	1.80	14.6
M55N2	1000	500	12	18	24	175.5	1.80	14.6
M55N2A	800	400	15	22	30	175.5	1.80	14.2
M55N2B	600	300	20	30	39	175.5	1.80	14.2
M55N2C	500	250	24	36	47	175.5	1.80	14.2
M55N2D	210	105	56	84	112	278.7	5.5	14.6
M55N3	150	75	76	119	158	278.7	5.5	14.6
M55N3A	100	50	118	177	236	278.7	5.5	14.6
M55N3B	50	25	236	354	472	278.7	5.5	14.6
M55N3C	32	16	370	555	740	278.7	5.5	14.6

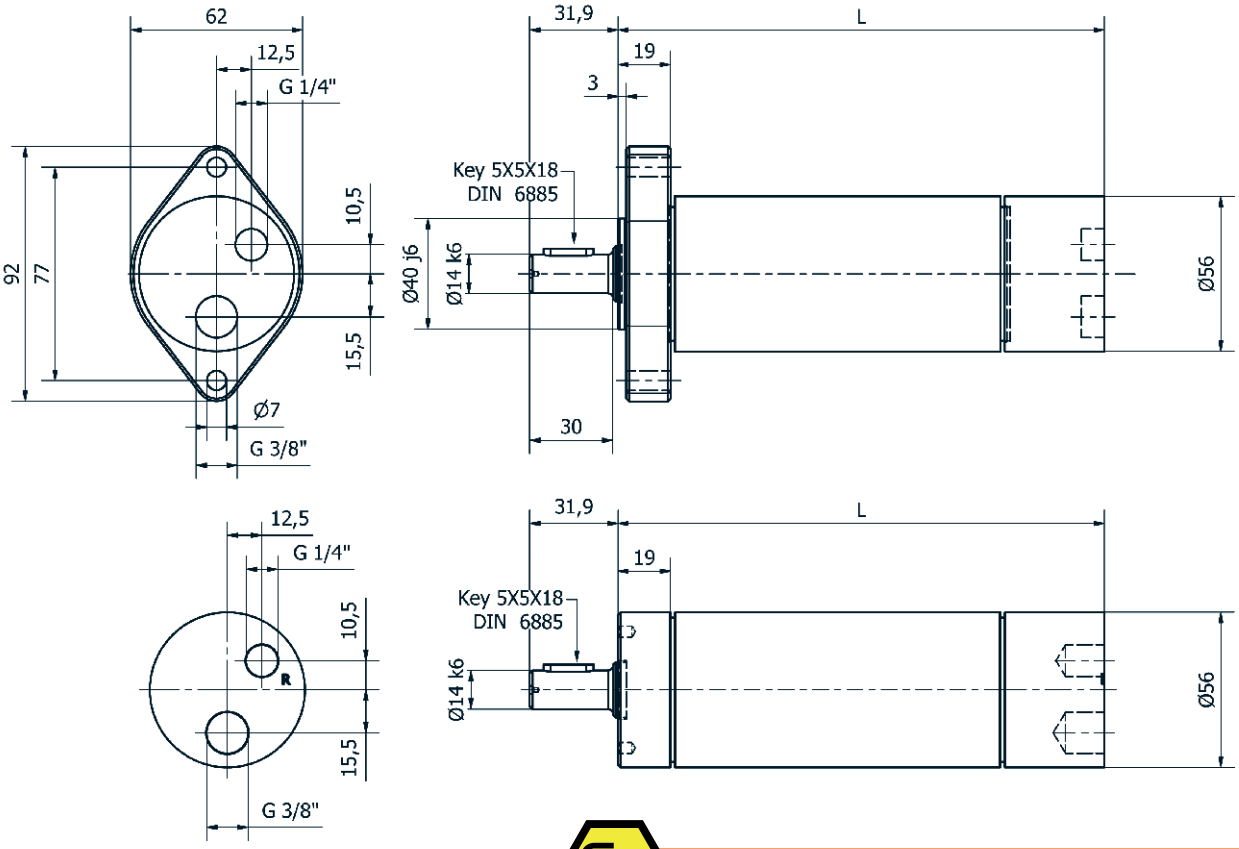
AVAILABLE VERSIONS
F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE
N - No lube
R - Reversible

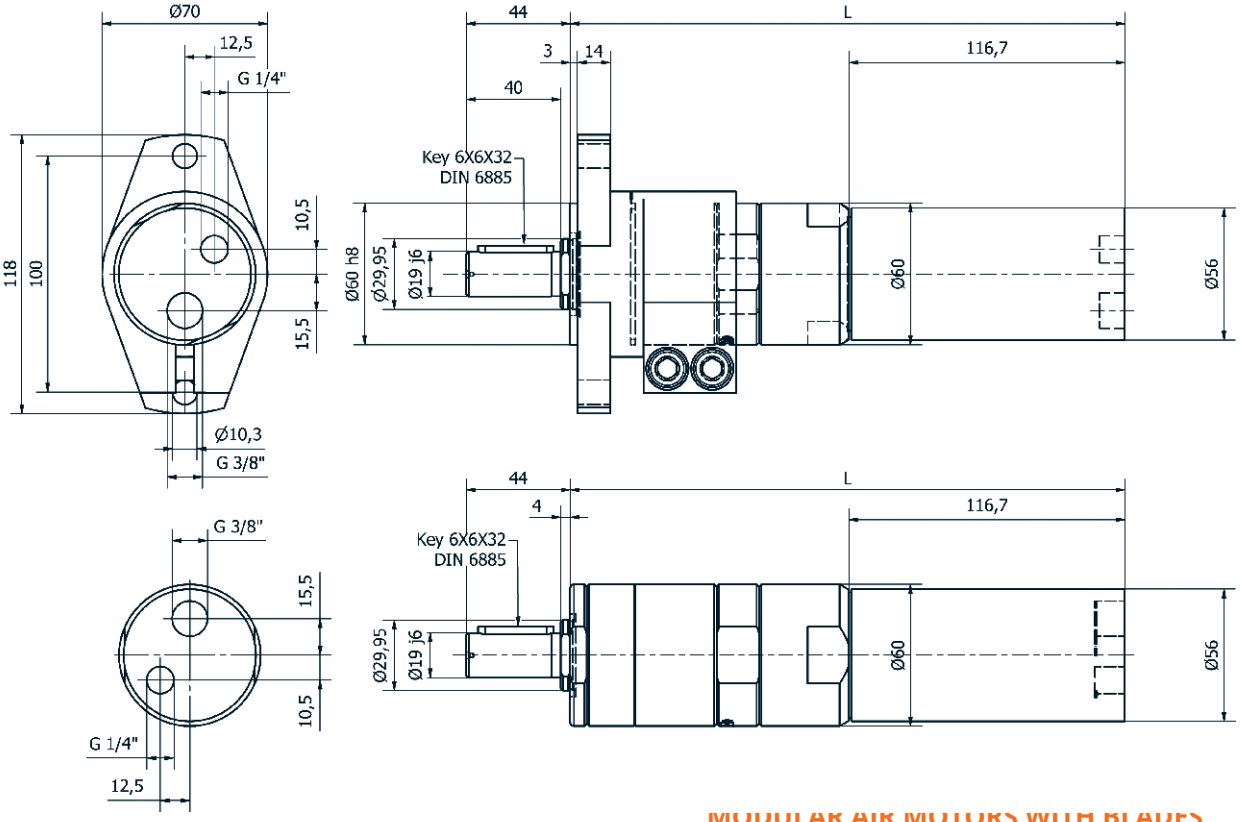
Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 2100 N max da N1 a N2C
3900 N max da N2D a N3C
Axial load: 1500 N max da N1 a N2C
1800 N max da N2D a N3C
Temperature operating: da -20°C a +80°C



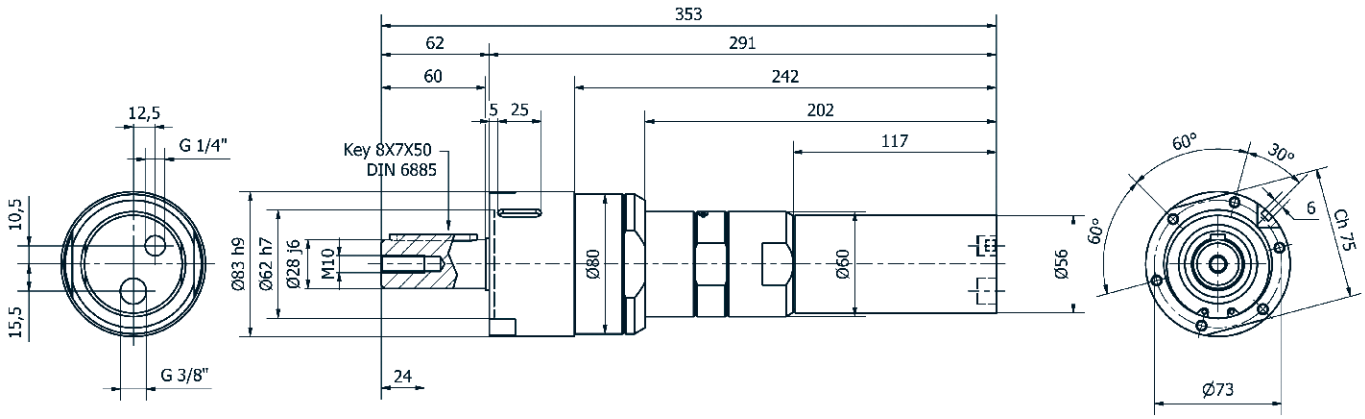
MODELS DA M55N1 A M55N2C



MODELS DA M55N2D A M55N3A



MODELS DA M55N3B A M55N3C



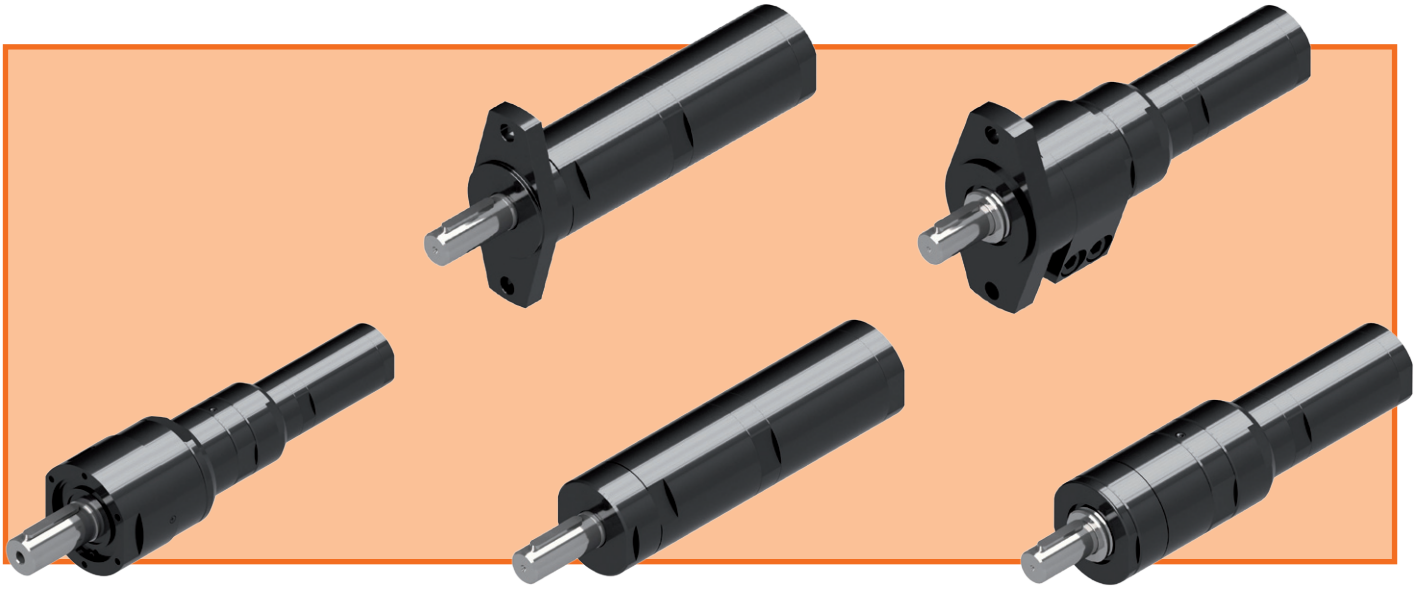
SERIES M62..... - HP 0,83 KW 0,62

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 0.83	HP 0.83	HP 0.83	HP 0.83	HP 0.83			
M62R1	17200	8600	0.70	1	1.4	135.5	1.2	14
M62R1A	4800	2400	2.4	3.7	4.8	135.5	1.2	14
M62R1B	3780	1890	3.1	4.6	6.2	135.5	1.2	14
M62R1C	2000	1000	5.9	8.8	12	135.5	1.2	14
M62R1D	1050	525	11	16	22	170.5	1.6	14
M62R2	740	370	16	23	31	170.5	1.6	14
M62R2A	460	230	25	37	50	170.5	1.6	14
M62R2B	240	120	47	71	94	219	2.5	14
M62R2C	140	70	81	122	162	219	2.5	14
M62R2D	100	50	114	171	228	219	2.5	14
M62R3	56	28	197	296	394	275.5	5.5	14
M62R3A	40	20	277	416	554	275.5	5.5	14

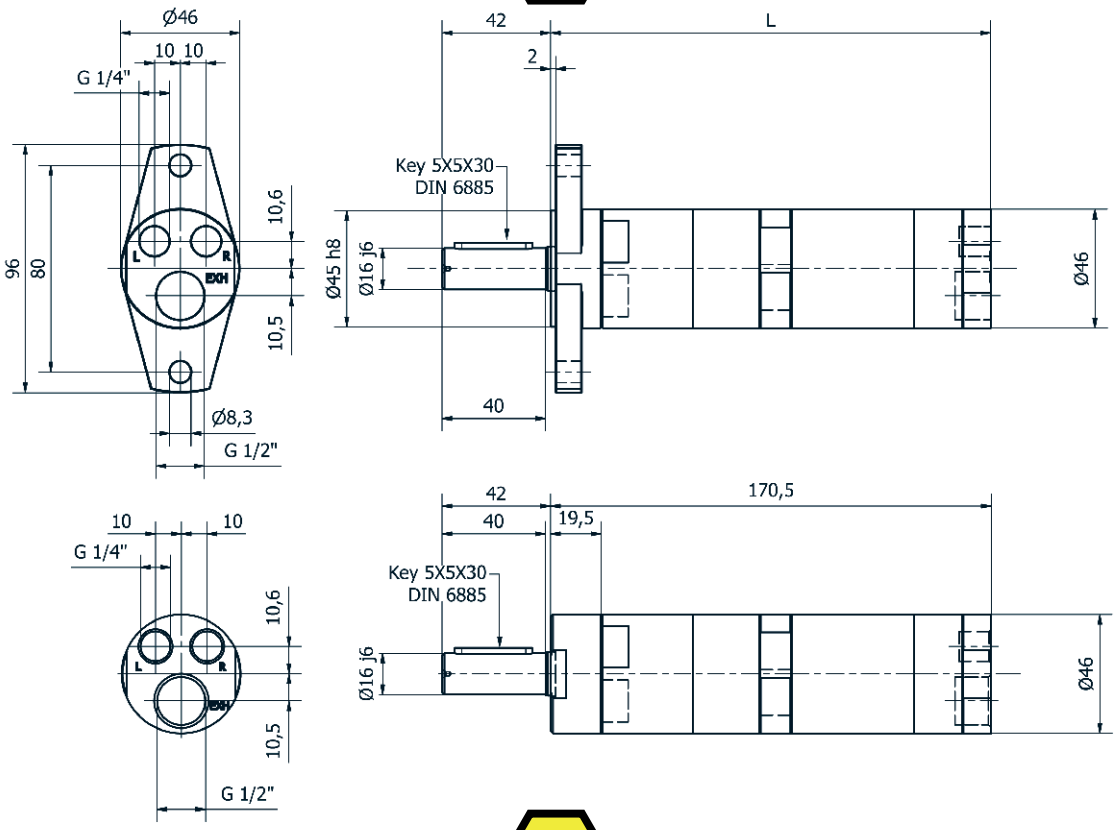
AVAILABLE VERSIONS
N - No lube
F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE
N - Non-reversible (right-hand rotation)
S - Non-reversible (counterclockwise rotation)

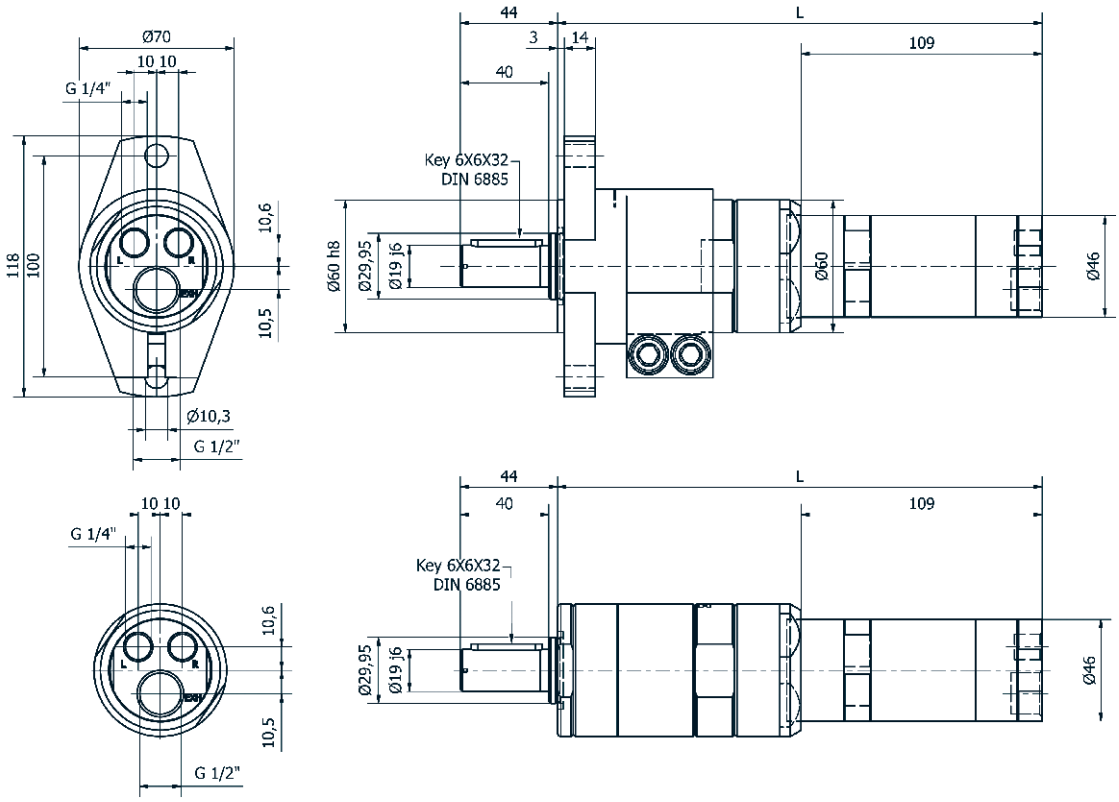
Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 1400 N max da R1 a R2A
3900 N max da R2B a R3A
Axial load: 1200 N max da R1 a R2A
1800 N max da R2B a R3A
Temperature operating: da -20°C a +80°C



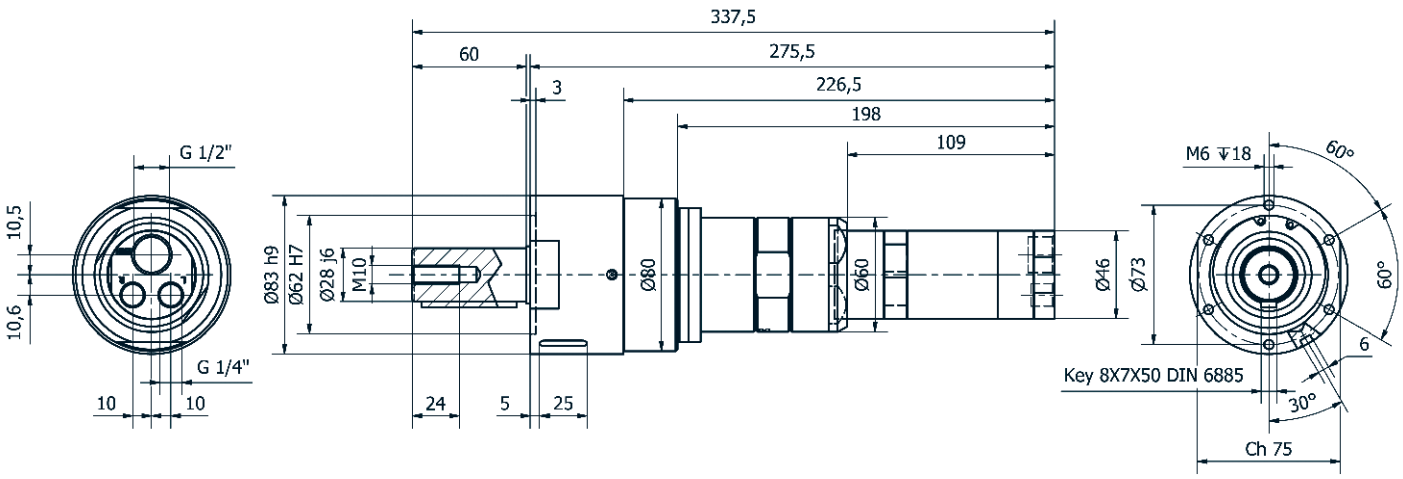
MODELS DA M62R1 A M62R2A



MODELS DA M62R2B A M62R2D



MODELS DA M62R3 A M62R3A



SERIES M82..... - HP 1 KW 0,82

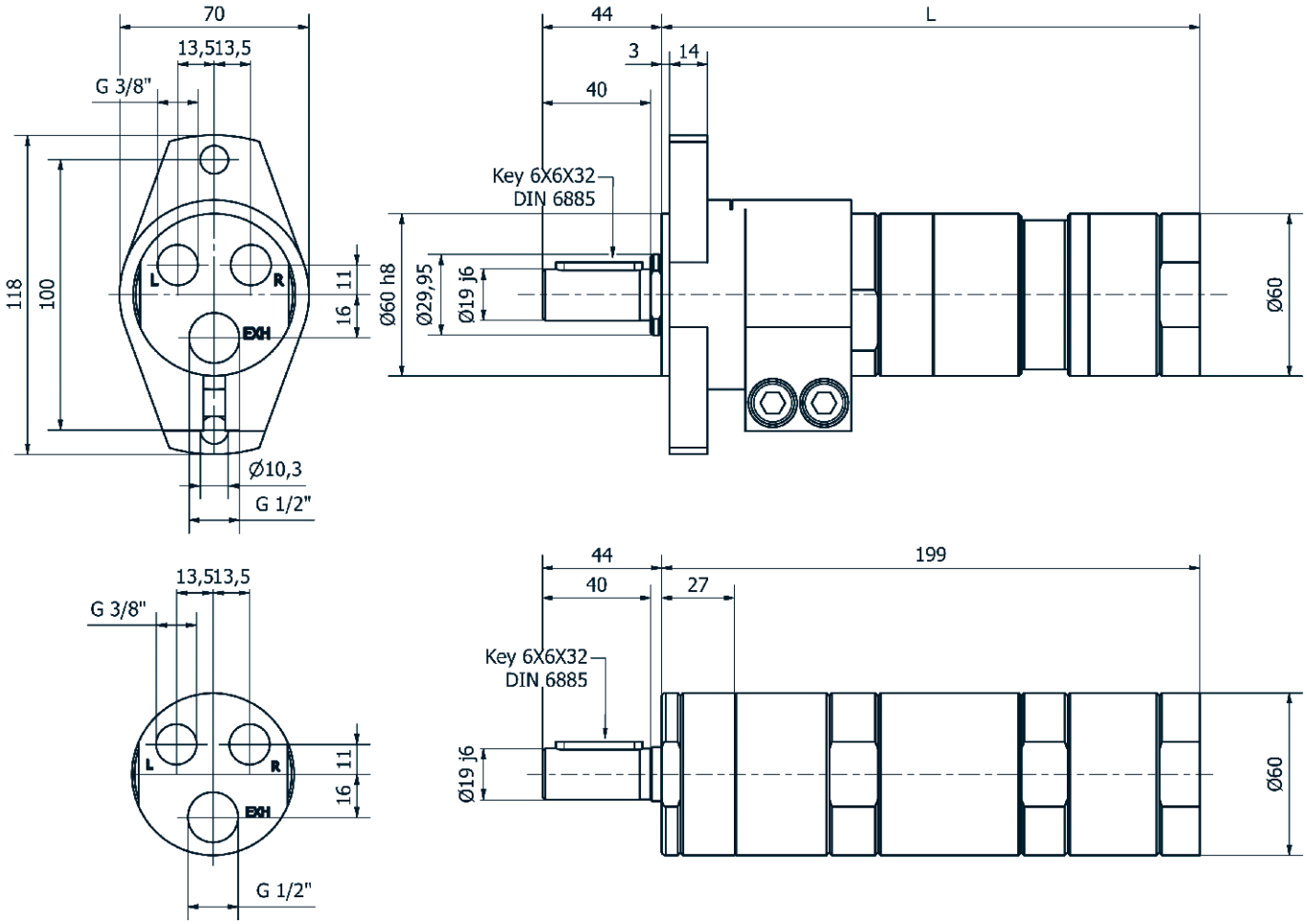
PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 1	HP 1	HP 1	HP 1	HP 1			
M82R1	13600	6800	1.2	1.7	2.3	199	2.3	18
M82R1A	4000	2000	3.9	5.8	7.8	199	2.3	18
M82R1B	2400	1200	6.5	9.5	13	199	2.3	18
M82R1C	1800	900	8.7	13	17	199	2.3	18
M82R1D	850	425	19	27	37	199	2.5	18
M82R2	520	260	30	45	60	199	2.5	18
M82R2A	400	200	39	59	78	199	2.5	18
M82R2B	200	100	78	117	156	255.5	4.6	18
M82R2C	130	65	120	180	240	255.5	4.6	18
M82R2D	90	45	174	261	348	255.5	4.6	18

AVAILABLE VERSIONS
N - No lube
F - Flange fixing
A - Atex Certification

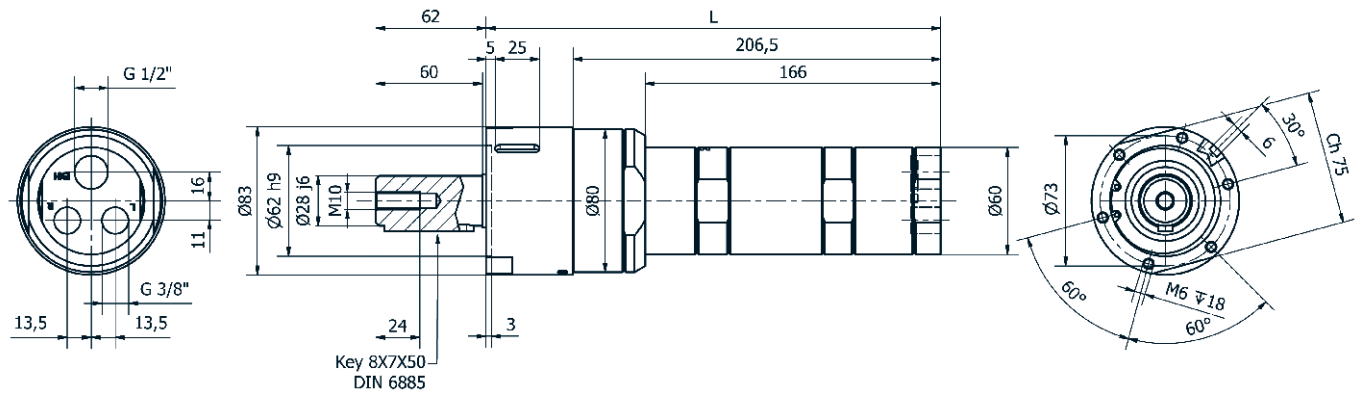
VERSIONS NOT AVAILABLE
N - Non-reversible (right-hand rotation)
S - Non-reversible (counterclockwise rotation)

Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 3900 N max da R1 a R2A
5600 N max da R2B a R2D
Axial load: 1800 N max da R1 a R2A
2800 N max da R2B a R2D
Temperature operating: da -20°C a +80°C

MODELS DA M82R1 A M62R2A



MODELS DA M82R2B A M62R2D



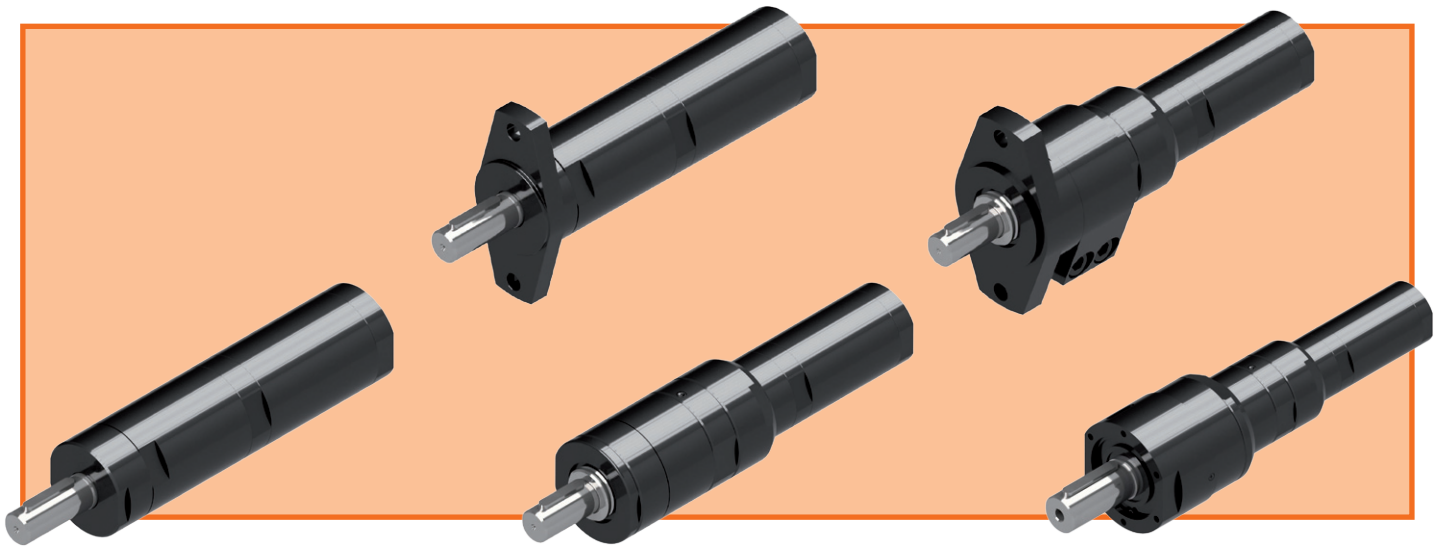
SERIES M84..... - HP 1,1 KW 0,84

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 1,1	HP 1,1	HP 1,1	HP 1,1	HP 1,1			
M84N1	21600	10800	0.70	1.1	1.4	135.5	1.2	16
M84N1A	6000	3000	2.7	4	5.4	135.5	1.2	16
M84N1B	4740	2370	3.3	5	6.6	135.5	1.2	16
M84N1C	2700	1350	5.9	8.9	12	135.5	1.2	16
M84N1D	1320	660	12	18	24	170.5	1.4	16
M84N2	1040	520	15	23	30	170.5	1.4	16
M84N2A	590	295	27	40	54	170.5	1.4	16
M84N2B	290	145	53	80	106	219	2.5	16
M84N2C	180	90	86	128	172	219	2.5	16
M84N2D	120	60	129	198	258	219	2.5	16
M84N3	70	35	215	232	430	275	5.5	16
M84N3A		25				275	5.5	16

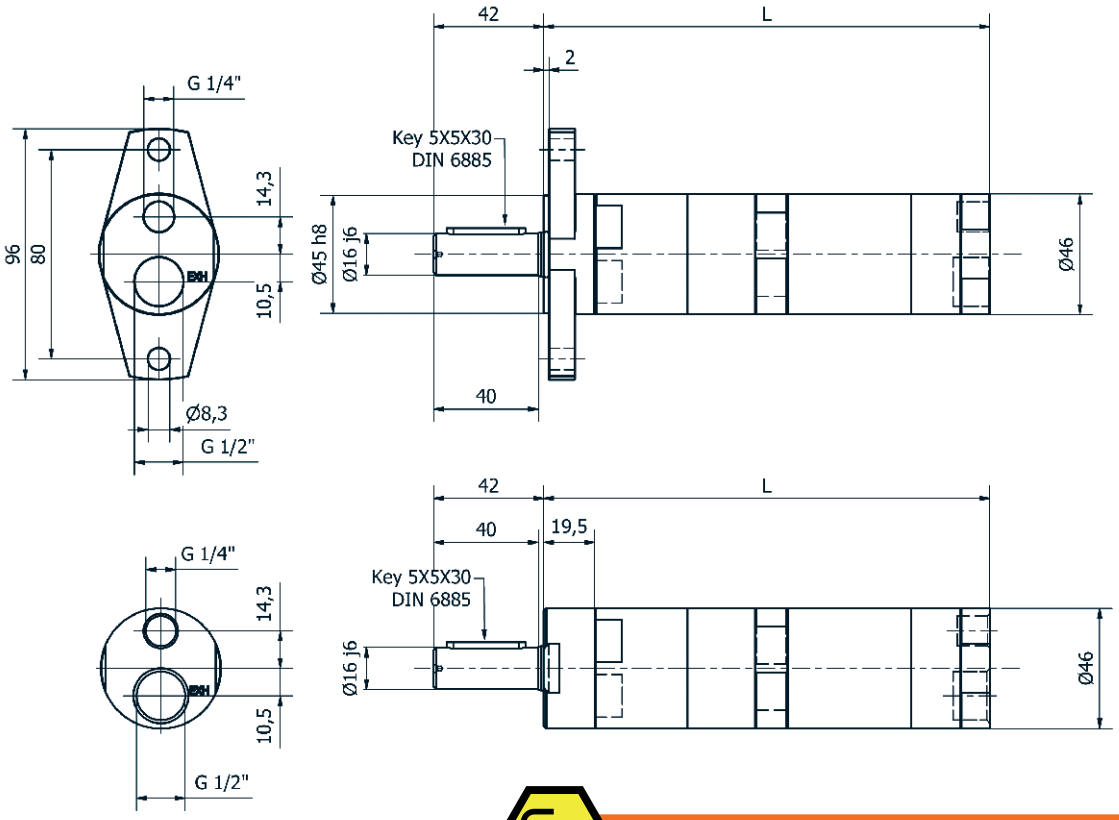
AVAILABLE VERSIONS
N - No lube
F - Flange fixing
A - Atex Certification

VERSIONS NOT AVAILABLE
R - Reversible

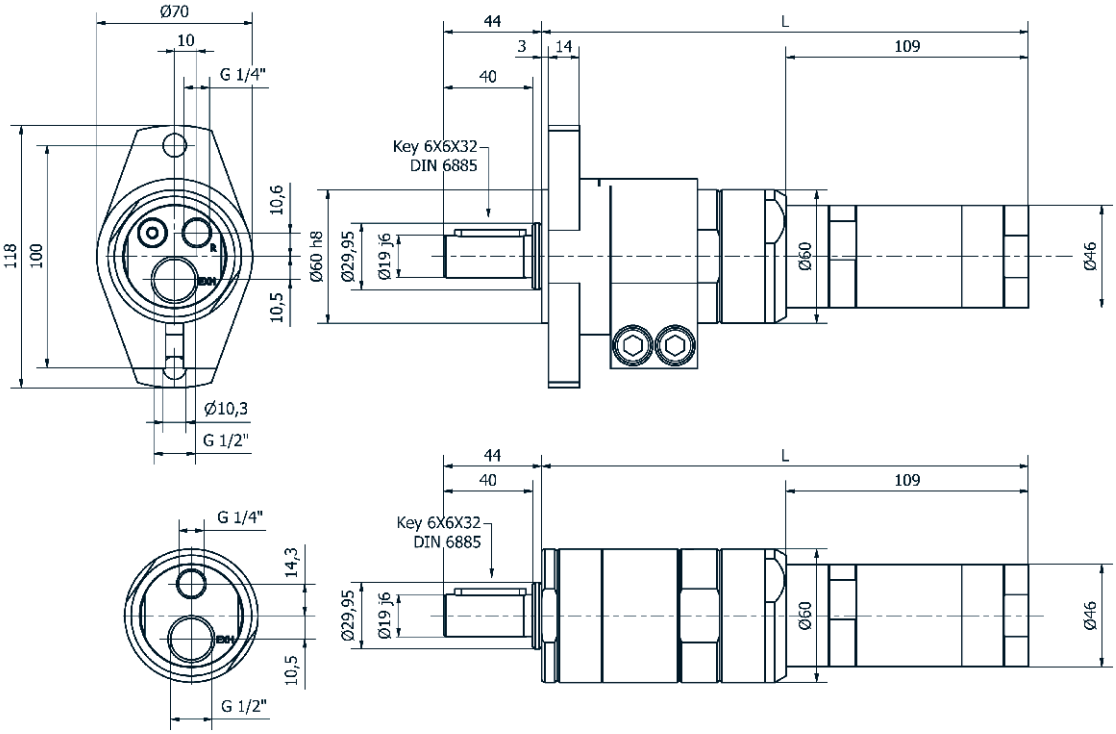
Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 1400 N max da N1 a N2A
3900 N max da N2B a N2D
5600 N max da N3 a N3A
Axial load: 1200 N max da N1 a N2A
1800 N max da N2B a N2D
2800 N max da N3 a N3A
Temperature operating: da -20°C a +80°C



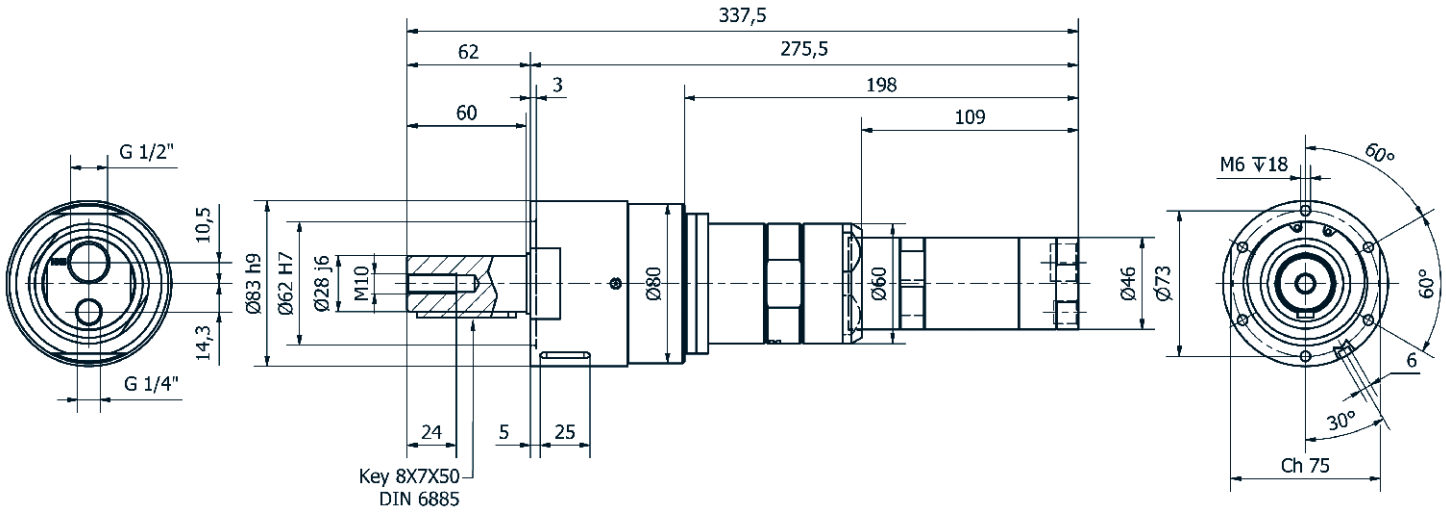
MODELS DA M84N1 A M84N2A



MODELS DA M84N2B A M84N2D



MODELS DA M84N3 A M84N3A



SERIES M120..... - HP 1,6 KW 1,2

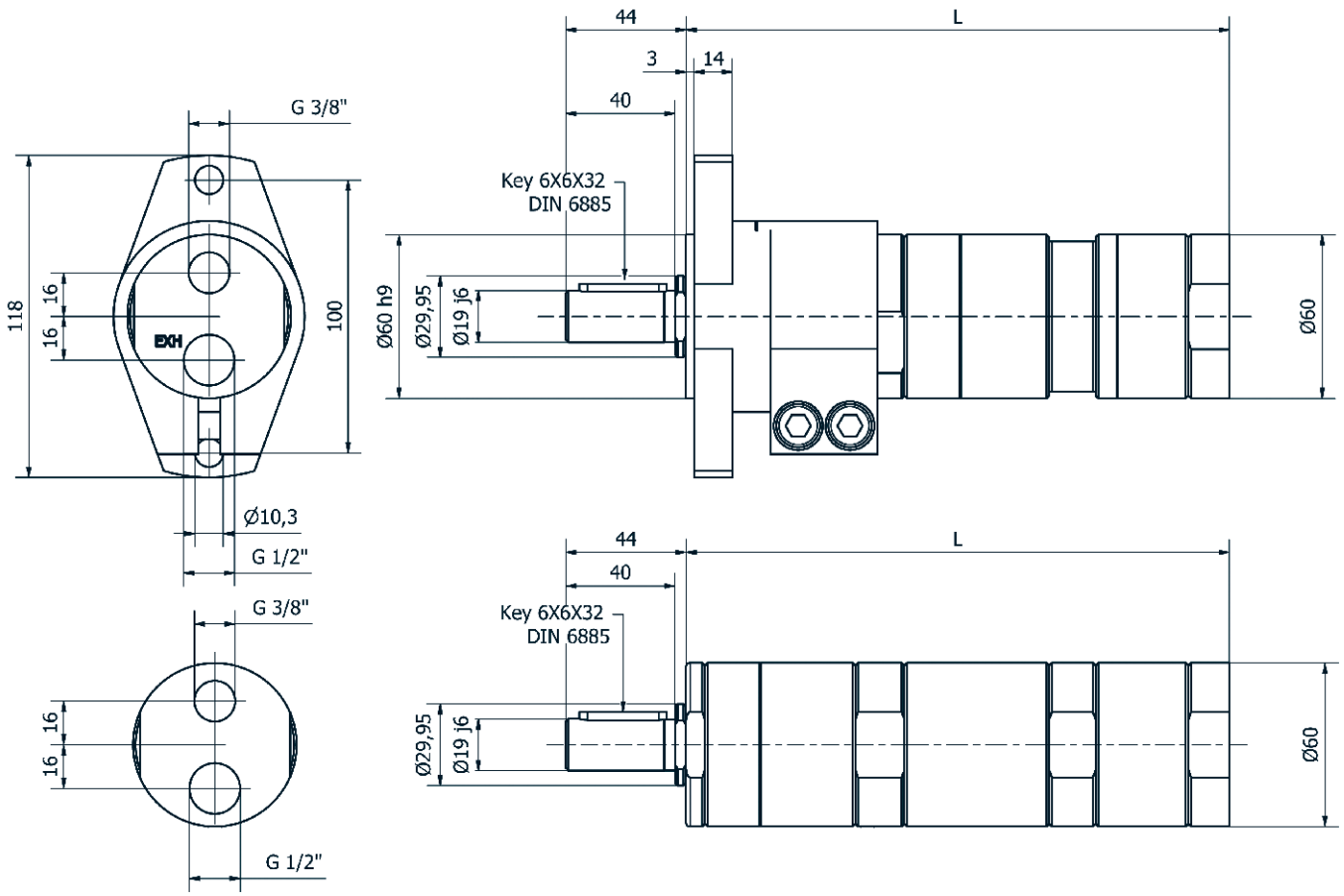
PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Speed at maximum Power Speed-RPM	Maximum torque Power Nm	Torque at the cue nm	Stall torque Nm	Quote "L" mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar	6,3 bar	6,3 bar	6,3 bar			
	HP 1,6	HP 1,6	HP 1,6	HP 1,6	HP 1,6			
M120N1	18600	9300	1.2	1.8	2.4	199	2.3	23
M120N1A	5400	2700	4.3	6.5	8.6	199	2.3	23
M120N1B	3200	1600	7	11	14	199	2.3	23
M120N1C	2400	1200	9.5	14	19	199	2.3	23
M120N1D	1200	600	19	38	38	199	2.5	23
M120N2	720	360	32	47	63	199	2.5	23
M120N2A	520	260	44	66	88	199	2.5	23
M120N2B	280	140	82	123	164	255	4.6	23
M120N2C	170	85	135	202	270	255	4.6	23
M120N2D	130	65	176	264	352	255	4.6	23

AVAILABLE VERSIONS
N - No lube
F - Flange fixing
A - Atex Certification

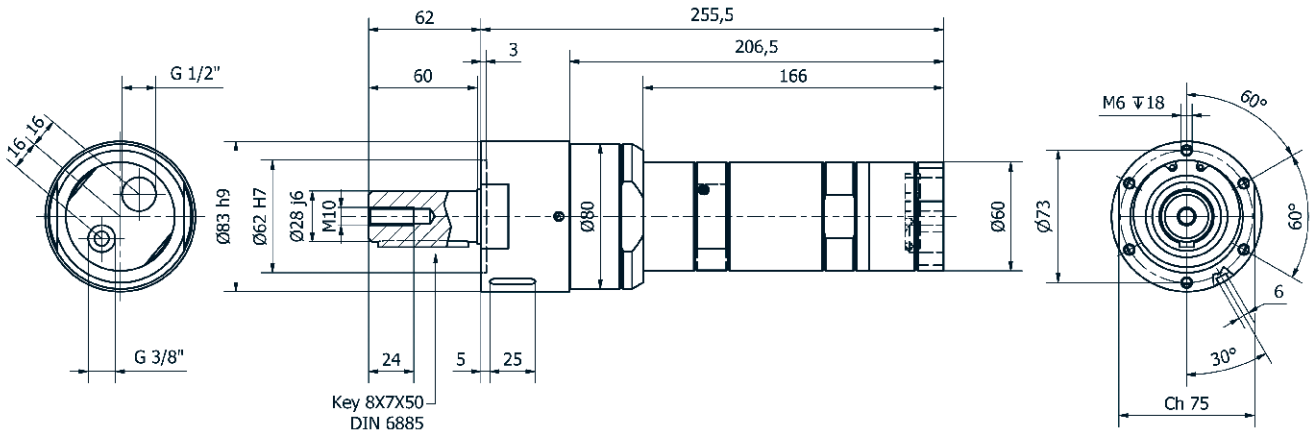
VERSIONS NOT AVAILABLE
R - Reversible

Lubrication: 2-3 drops/1' in continuous service
4-6 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 3900 N max da N1 a N2A
5600 N max da N2B a N2D
Axial load: 1800 N max da N1 a N2A
2800 N max da N2B a N2D
Temperature operating: da -20°C a +80°C

MODELS DA M120N1 A M120N2A



MODELS DA M120N2B A M120N2D

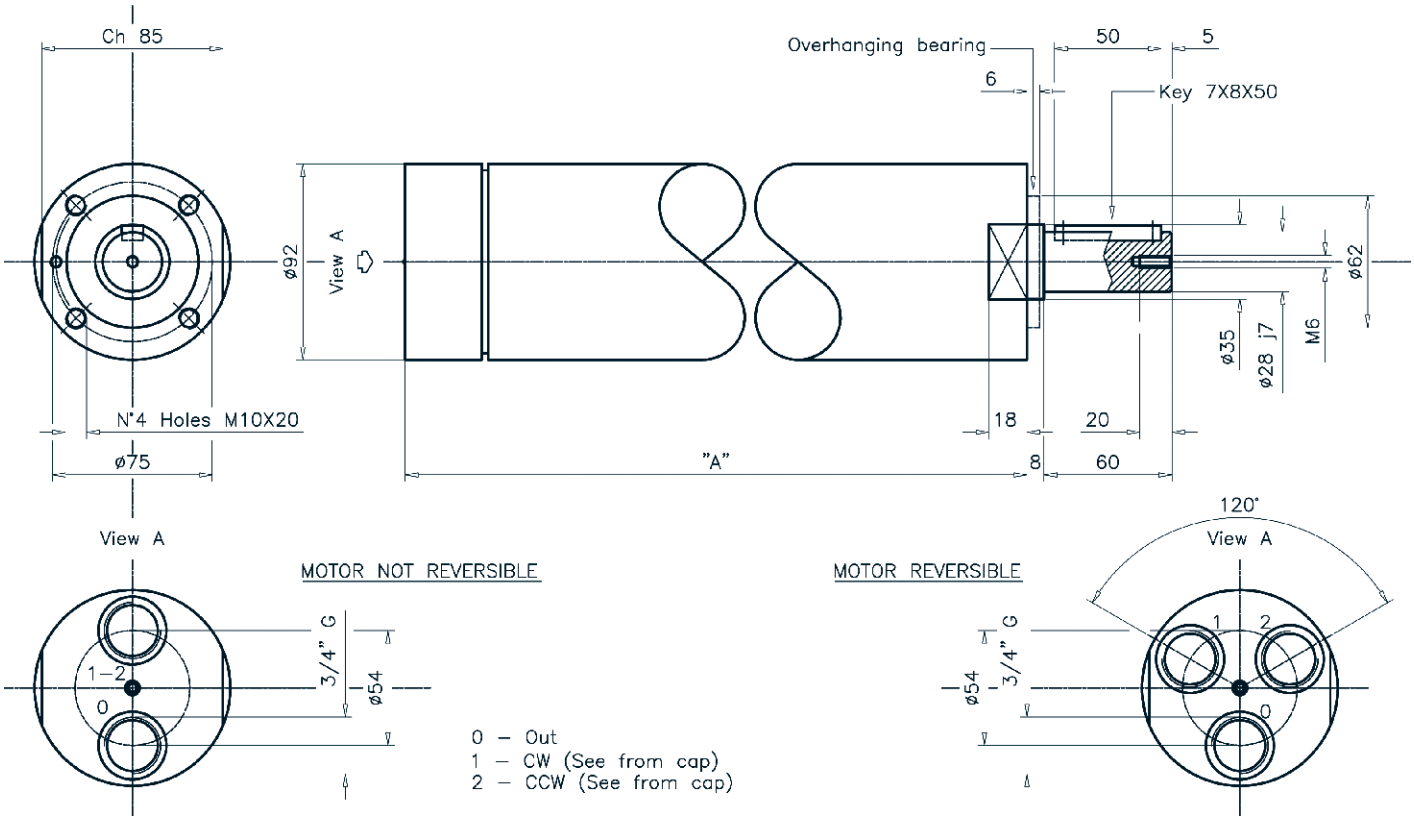


SERIES M400..... - HP 4,0 KW 2,9

PERFORMANCE AND DIMENSIONS																			
MODEL		Free Speed-RPM			Speed at maximum Power Speed-RPM			Maximum torque Power Nm			Torque at the cue nm			Stall torque Nm			Quote "A" mm	Weight Kg.	No. of reduction stages
Reversible	Non Reversible	7 bar	5 bar	3 bar	7 bar	5 bar	3 bar	7 bar	5 bar	3 bar	7 bar	5 bar	3 bar	7 bar	5 bar	3 bar			
		HP 4,0	HP 2,6	HP 1,6	HP 4,0	HP 2,6	HP 1,6	HP 4,0	HP 2,6	HP 1,6	HP 4,0	HP 2,6	HP 1,6	HP 4,0	HP 2,6	HP 1,6			
M400RA	M400NA	3200	2900	2400	1600	1450	1200	17	12	8	27	19	13	35	25	17	210	6,2	1
M400RB	M400NB	1900	1700	1400	950	850	700	29	21	14	47	33	23	58	43	29	210	6,2	1
M400RC	M400NC	1050	950	800	525	475	400	53	37	27	83	58	44	107	74	54	210	6,2	1
M400RAA	M400NAA	650	570	480	325	285	240	86	66	44	137	105	73	171	132	88	247	7,8	2
M400RAB	M400NAB	460	410	350	230	205	175	117	86	63	186	137	100	235	171	127	247	7,8	2
M400RBA	M400NBA	380	340	280	190	170	140	147	107	78	235	166	122	294	215	156	247	7,8	2
M400RBB	M400NBB	270	240	200	135	120	100	200	147	105	323	235	171	401	294	210	247	7,8	2
M400RCA	M400NCA	210	180	160	105	90	80	264	176	137	421	284	225	529	352	274	247	7,8	2
M400RCB	M400NCB	150	130	110	75	65	55	372	264	196	588	421	313	744	529	392	247	7,8	2
M400RAB4	M400NAB4	110	104	85	55	52	43	480	343	254	764	548	406	960	686	509	292	9,8	3
M400RBA4	M400NBA4	95	84	70	47	42	35	588	421	308	940	676	490	1.176	842	617	292	9,8	3
M400RBB4	M400NBB4	70	60	50	35	30	25	808	578	426	1.293	931	686	1.617	1.156	852	292	9,8	3
M400RCA4	M400NCA4	52	46	40	26	23	20	1.058	764	558	1.685	1.225	891	2.116	1.528	1.117	292	9,8	3
M400RCB4	M400NCB4	36	32	28	18	16	14	1.470	1.078	784	2.381	1.715	1.254	2.940	2.156	1.568	292	9,8	3

Lubrication: 5-6 drops/1' in continuous service
10-12 drops/1' in intermittent service
Filtration: 64 µ or better
Radial load: 4000 N max
Axial load: not allowed
Temperature operating: da -20°C a +80°C

Consumption aria	a 7 bar 63 l/sec	a 6 bar 58 l/sec.	a 5 bar 52 l/sec	a 4 bar 44 l/sec	a 3 bar 32 l/sec	a 2 bar 21 l/sec


Ch 85
Overhanging bearing
50
5
6
Key 7X8X50
ø92
View A
ø62
ø35
ø28 j7
M6
N°4 Holes M10X20
ø75
18
20
"A"
8
60
View A
MOTOR NOT REVERSIBLE
3/4" G
ø54
1–2
0
0 – Out
1 – CW (See from cap)
2 – CCW (See from cap)
120°
View A
MOTOR REVERSIBLE
3/4" G
ø54
1
2
0

PNEUMATIC PLIER MOTORS

TSA also offers a wide range of motors with pliers, which are ideal for piercing or brushing, whose size is limited and which are fitted with a rotating splashguard on the spindle. Possibility of installation on production lines, machine tools, robot stations. Stainless steel body and spindle.

Rotation
N - Not Reversible (right-hand rotation)
S - Not Reversible (counterclockwise rotation)

PLIER
Ø 3.0
Ø 5.0
Ø 6.0
Ø 8.0
Ø 10.0

MP - 19 - N - PO - 6

MP
Motor with plier

Engine Size
19 – 380W
52 – 380W
29 - 380W
24 - 380W
12 - 380W

Exhaust
PO - Free rear air discharge equipped with a sintered disc silencer
PG - Rear air discharge guided

Free Exhaust

Guided exhaust

PERFORMANCE AND DIMENSIONS							
Model	Free Speed-RPM	Power W	Plier standard mm	Rumorosità dB(A)	Corps diameter mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar					
MP19NPO	19000	380	6.0	72	42	1.12	8.5
MP52NPO	5200	380	6.0	72	42	1.12	8.5
MP29NPO	2900	380	6.0	72	42	1.12	8.5
MP24NPO	2400	380	6.0	72	42	1.12	8.5
MP12NPO	1200	380	6.0	72	42	1.12	8.5

AVAILABLE VERSIONS
S - Not Reversible (counterclockwise rotation)
PG - Rear air discharge guided

For specific drawings, contact the TSA technical office.

MOTORS WITH SPINDLE

TSA offers a range of motors with spindle, ideal for piercing or brushing, whose size is limited. Possibility of installation on production lines, machine tools, robot stations. Body and spindle made of stainless steel.

Rotation
R - Reversible
N - Not Reversible (right-hand rotation)

Reduction ratio
1-1A-1B-1C

MA - 23 - R - 1A

MA
Motors with Spindle

Engine Size
23 - 230W Reversible
35 - 160W Right-handed
38 - 380W Right-handed
40 - 550W Reversible
50 - 160W Right-handed

PERFORMANCE AND DIMENSIONS								
Model	Free Speed-RPM	Power W	Spindle capacity mm	Cono o Filetto	Noise dB(A)	corp diameter mm	Weight Kg.	Consumption l/sec
	6,3 bar	6,3 bar						
MA23R1	4000	230	1-10	3/8"-24UNF	72	42	1.25	7.8
MA23R1A	2000	230	1-10	3/8"-24UNF	72	42	1.25	7.8
MA23R1B	1000	230	1-10	3/8"-24UNF	72	42	1.25	7.8
MA35N1	3500	160	1-6	B10	71	31	0.62	5.6
MA38N1	5200	380	1-10	3/8"-24UNF	76	42	1.2	8.5
MA38N1A	2900	380	1-10	3/8"-24UNF	76	42	1.2	8.5
MA38N1B	2400	380	1-10	3/8"-24UNF	76	42	1.2	8.5
MA38N1C	1200	380	1-10	3/8"-24UNF	76	42	1.2	8.5
MA40R1	4800	550	1-10	1/2"-20UNF	78	56	2.6	15
MA40R1A	3400	550	1-10	1/2"-20UNF	78	56	2.6	15
MA40R1B	3000	550	1-10	1/2"-20UNF	78	56	2.6	15
MA50N1	5000	160	1-6	B10	71	31	0.62	5.6

For specific drawings, contact the TSA technical office.

ENGINES WITH CORNER PLIERS

Motor with pliers

Rotation
N - Not Reversible (right-hand rotation)

Pliers
Ø 3.0
Ø 6.0
Ø 8.0

N - ME - 38 - N - 1A - 8

N – No lube
Standard

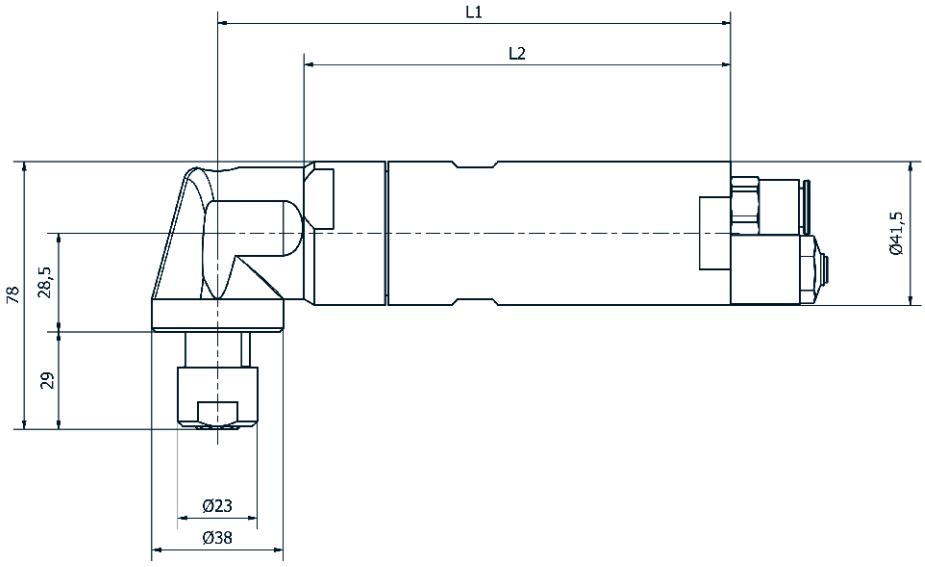
Motor size
38 - Right-hand

Reduction ratio
1-1A-1B-1C-1D-2

PERFORMANCE AND DIMENSIONS									
Model	Free Speed-RPM	Torque max Nm	Standard pliers mm	Air discharge	Corp diameter mm	Weight Kg.	Consumption l/sec	Length L1 mm	Length L2 mm
	6,3 bar	6,3 bar							
ME38N1	18000	1	8	Post. guided	41.5	1.40	8.3	148.5	123.5
ME38N1A	5200	1	8	Post. guided	41.5	1.40	8.3	148.5	123.5
ME38N1B	2900	1	8	Post. guided	41.5	1.40	8.3	148.5	123.5
ME38N1C	2300	1	8	Post. guided	41.5	1.40	8.3	148.5	123.5
ME38N1D	1100	1	8	Post. guided	41.5	1.40	8.3	181.5	181.5
ME38N2	640	1	8	Post. guided	41.5	1.40	8.3	156	156

AVAILABLE VERSIONS
N - No lube

For specific drawings, contact the TSA technical office.



PNEUMATIC ACCESSORIES

TSA offers a pneumatic component programme for air treatment and control of pneumatic motors on premium brands, including SMC, BOSCH, NORGREN, WILKERSON. This programme consists of air treatment units, valves and silencers. The available connections range from G1/4" to G2".

AIR TREATMENT UNITS

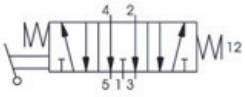
All of the filters used have automated condensation discharge, the FRL units are installation-ready and fitted with a pressure gauge.

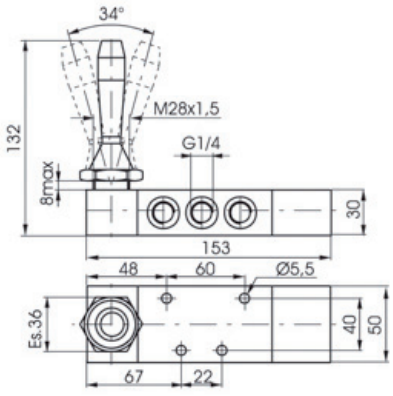
Models	TFRL3/8	TFRL1/2	TFRL3/4	TFRL1	TFRL2
Connection	3/8"	½"	¾"	1"	2"
Max. operating pressure	10 Bar	10 Bar	10 Bar	10 Bar	20 Bar
Max. operating temperature	-5 a +60°C				
Standard filtration rate	8 Micron				
Flow rate in l/sec	56,6	63,2	67,5	149	660

MANUAL OR PNEUMATIC CONTROL VALVES

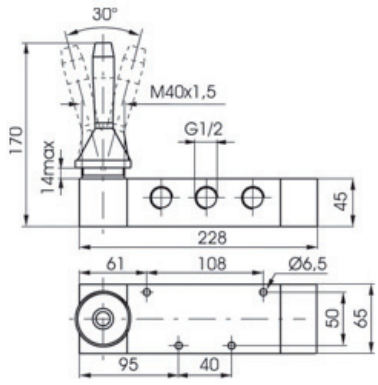
Easy and quick to install, the default valves fitted on TSA pneumatic motors are 5-way 3-position valves with centres open in idle position, with lever or pneumatic control.

Modelli	VCM1/4	VCM1/2	VCM1	VCP1/4	VCP1/2	VCP1
Connessione	G1/4"	G½"	G1"	G1/4"	G½"	G1"
Fluido	Filtered and lubricated air					
Pressione max. d'esercizio	10 bar					
Temperatura	-5°C +70°C					
Portata a 6 bar con Δ p = 1 Nl/min	1280	3500	6500	1280	3000	6500
Ø Passaggio nominale	8mm	15mm	20mm	8mm	15mm	20mm
Materiale corpo	Aluminum					
Kg.	0,7	2	5	0,6	1,7	4,2
Pressione minima di pilotaggio	-	-	-	3 bar	3 bar	3 bar
Connessione pilotaggio	-	-	-	G1/8"	G1/8"	G1/8"

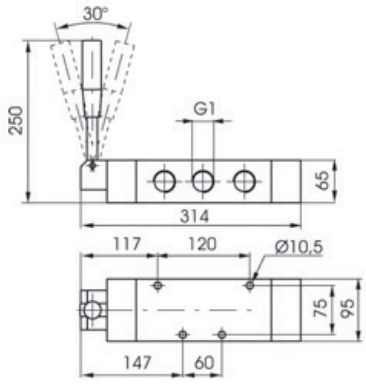




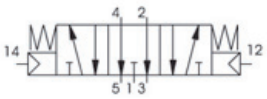
VCM1/4

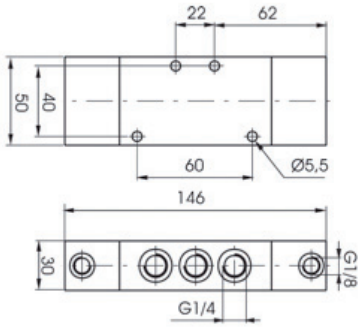


VCM1/2

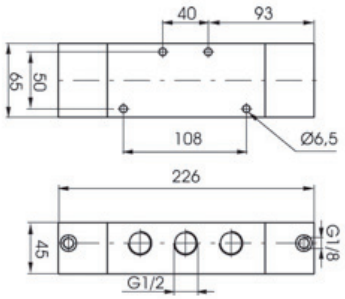


VCM1

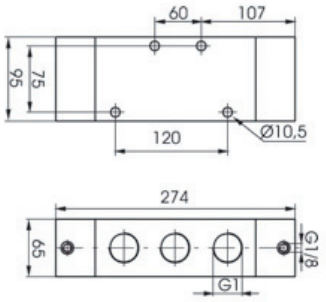




VCP1/4



VCP1/2



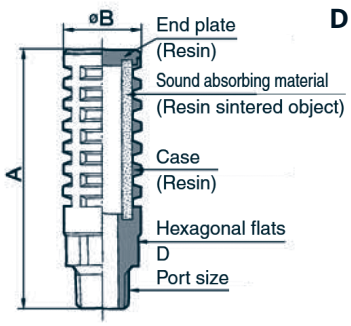
VCP1

SILENCERS

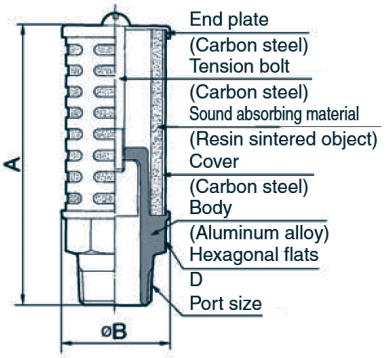
All motors are fitted with a threaded exhaust gate, which makes it possible to add a silencer in order to reduce the noise level. It is also possible to add another hose between exhaust and silencer which will further reduce the noise level.

Models	S1/4	S3/8	S1/2	S3/4	S1	S1 1/4
Connection	¼ NPT	3/8 NPT	½ NPT	¾ NPT	1 NPT	1 ¼ NPT
Noise dB reduction	>30 dB(A)					
Fluid	compressed air					
Operating temperature	+5° C – 60° C					
Body	Plastic	Plastic	Plastic	Steel + Plastic	Steel + Plastic	Steel + Plastic

Dimensions S1/4 – S1/2



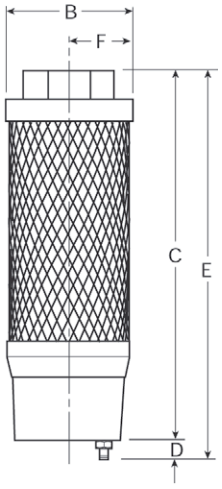
Dimensions S3/4 – S1 1/4



Dimensions	S1/4	S3/8	S1/2	S3/4	S1	S1 1/4
A	63	84	92	107	127	186
B	22	25	30	46	50	74
D	19	22	27	36	41	50

DISSOLATOR / SILENCER FILTER

Models	XMC-C4-000	XMC-C8-000	XMC-CB-000	S3/4	S1	S1 1/4
Connection	½ G	1 G	1 - 1/2 G	107	127	186
Bath capacity	2.2 fl. oz.	5 fl. oz.	5 fl. oz.	46	50	74
Drain	Manual	22	27	36	41	50
oiling	99.9%					
Operating temperature	2° C – 50° C					
Sound reduction	25 dB(A)					
Kg.	0.4					



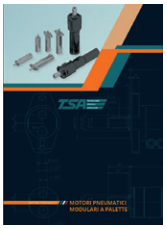
CONSTRUCTION MATERIALS

Threaded cover	Nylon
Filter element	
Primary	borosilicate cloth
Secondary	PVC fiber
Oil cover of waste	Plastic
Sleeve support	Plastic

Model	A	B	C	D	E	F
XMC-C4-000	51	60	100	10	150.9	30
XMC-C8-000	51	60	148	10	198.9	30
XMC-CB-000	76	87	208	11	284	-

PNEUMATIC MOTORS



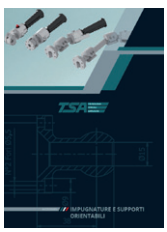


GEAR-MOTORS

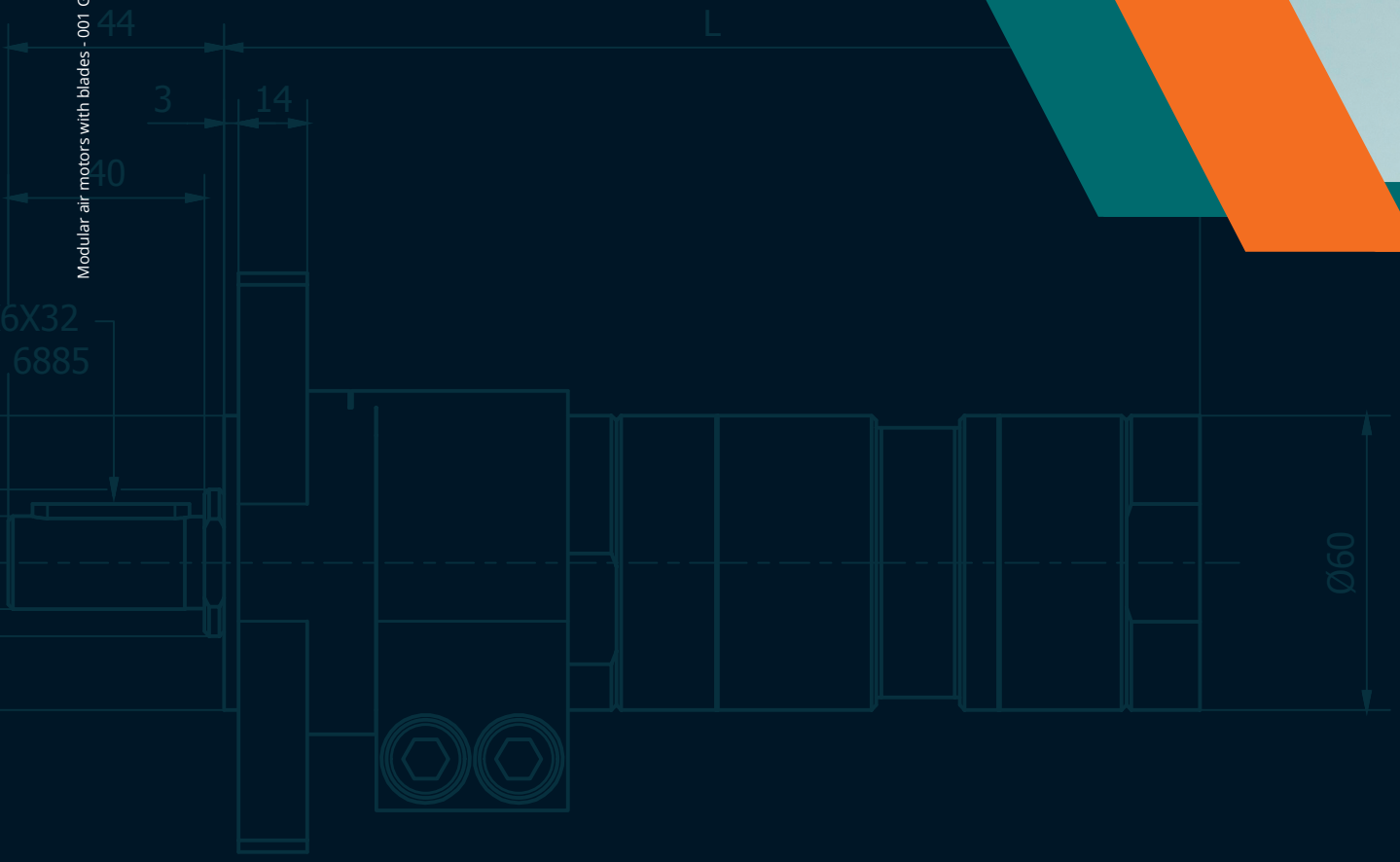
TELESCOPIC BOOMS

ARTICULATED BOOMS

ACCESSORIES



Modular air motors with blades - 001 GB - 2018



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