Operation manual

Pneumatic cylinders acc. to DIN ISO 15552 and DIN ISO 6432 / CETOP RP52-P

General technical data

Types, NS dimensions	**Plastic cylinders** Type 1101 NS 12/16/20/25 DIN ISO 6432 Type 1102 NS 32/40/50 ISO 15552 / CETOP RP52-P Type 1108 NS 32/40/50/80 ISO 15552 / CETOP RP52-P Type 1110 NS 32/40/50/80 DIN ISO 15552 Type 1120 NS 32/40/50 DIN ISO 15552 Type 1122 NS 12/16/20/25 DIN ISO 15552
Functions	Single- (SA) double-acting (DA)
Construction materials	Back & front end piece: PA6GF/PPGF/PA12GF Cylinder pipe: PA6/PPGF/PA12 Piston rod: V4A Joints and gaskets: NBR/FPM/PU
Attachment modes	At the head or cap and flange front/back, with Joint head (plastic / steel / stainless steel) Quicklink (plastic / steel / stainless steel) Quicklink – hinged joint (plastic) Bearing support (plastic) Foot mounting (steel / stainless steel) Fork (aluminium black eloxadized) Shackle (aluminium black eloxadized)
Idle strokes	Standard idle stroke NS 12/16 up to max. 200 mm Standard idle stroke NS 20/25/32/50/80 up to max. 300 mm
Connections	NS 12/16 = air connection thread M5 NS 20/25/32 = air connection thread G1/8“ NS 40/50 = air connection thread G1/4“ NS 80 = air connection thread G3/8“
Integration position	Optional
Ambient temperature (standard)	-20° to +80°C
Ambient temperature ex-protection	-20° to +60°C
Medium temperature	-20° to +60°C

Pneumatic data cluster

Operating pressure	1-10 bar
Speed	10-1000 mm/sec. (without load)
Media	filtered air <50 µ (oiled or unoiled) / water (on request)

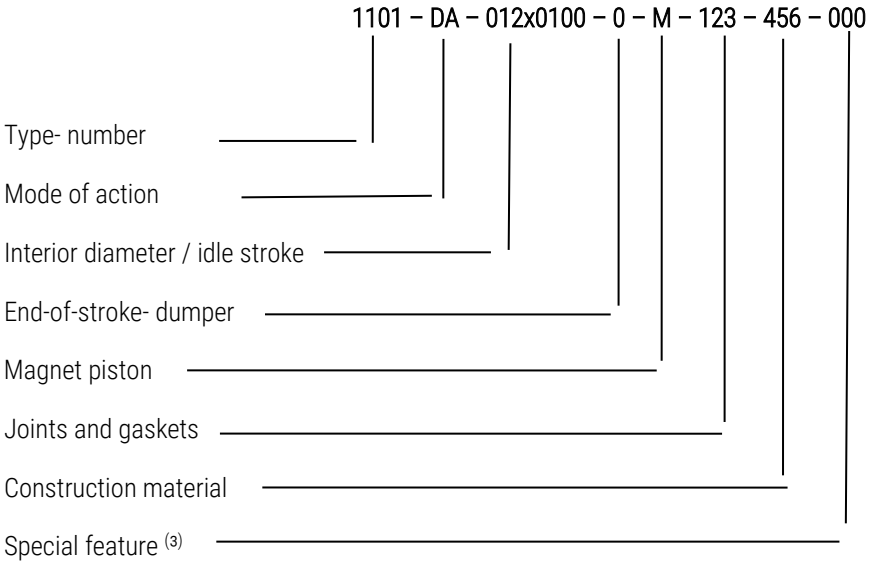
Plastic cylinders

Order key (standard versions)

Features	Symbol, description
Type-numbers	**1101** – NS 12…25 (ISO-dimension) PA30 GF **1102** – NS 32…50 (ISO/CETOP – connections dimension) PA30 GF **1108** – NS 12…80 (complete plastic materials-special-solution) PP / PA / PPS **1110** – NS 32…80 (ISO-dimension_aggr. environment) PP30 GF **1120** – NS 32…50 (ISO-dimension_FDA-approved) PA12 GF **1122** – NS 12…25 (ISO-dimension_FDA-approved) PA12 GF
Mode of actions	**SA** (single acting) [1], **DA** (double acting)
Interior diameter (NS) x idle stroke	**012 x 0100** (example)
End-of-stroke dampers	**0** (without end-of-stroke damper), **E** (with end-of-stroke damper) [2]
Magnet piston	**0** (without magnet piston), **M** (with magnet piston)
Joints and gaskets	**1.Position:** gasket scraper ring **2.Position:** static joints and gaskets (O-ring) **3.Position:** piston seals **Construction material: N** (NBR), **F** (FPM), **T** (PTFE), **E** (EPDM), **U** (PU), **O** (without)
Materials of individual component	**4. Position:** piston rod **5. Position:** front – and back end piece **6. Position:** cylinder tube **Materials: A** (PA6), **S** (PPS), **P** (PP), **M** (POM), **V** (VA), **K** (PEEK), **L** (PA12)
Special feature[3]	Custom-built

[1] Not for NS 32…50 [2] Not for NS 12…20

Ordering key-example:



[3] **Examples for special feature:** cylinder for hydraulic use, special screw thread at the plunger rod, extended or shorted screw thread, brass-flush-bushing, color of the cylinder, special construction material and so on.

General references

A. Safety
PSK plastic cylinders are designed and manufactured according to the current state of technology and generally dependable. Pneumatic cylinders can nevertheless cause danger if they are used improperly or used in not conventional purpose.
Every person, involved, in the operation of the user, with the assembly, disassembly, operation and maintenance of the cylinder, must have read and understood the complete operation constructions, including the standards and regulations. Especially attention must be paid to the DIN 983 „safety requirements to fluid power system and components" UVV VBG § 23 and § 24 and following. Installation and bringing into service have to be only carried out by qualified personnel, according to the operating instruction.
Unauthorized, erroneously or unexpected start-up has to be prevented. Relevant laws and decrees related to supervision duty constructions must be followed.

B. Application
For the application area and firm limitations, the corresponding data sheet, offer- and order confirmation text have to be pointed out. Additional, depending on the individual case, complementary technic information are provided.

Installing Piping systems

Laying the lines
Piping for peripherals should preferably consist of corrosion-resistant material like for example (copper, synthetics or chainless steel). When using steel pipes, oil-fog lubricators must be installed in the pipe system. All pipe systems have to be lay clean and free of burrs; swarf, tinder and so on, which are formed by the processing of the pipeline, must be removed. In case of longer pipelines, attention must be paid to a slope for the condensation water. Containers, for receiving condensation water, shall be provided at low, well-accessible places; these containers must be drained out, at regular intervals, depending on the condensation formation, via drain cocks. Pipelines, which are mounted over open-air ground or be subject to strong temperature fluctuation, must be insulated. Especially at temperature close the freezing point or below ensure an immaculate drainage.

Mounting
The cylinders are to be stored dry and secured to dirt and damage. The caps at the connections must be removed shortly before the assembly. The fitting position of the cylinder is optional.
With Type 1101 and 1109 the front and the back end pieces are supported rotatable by 360°.
With Type 1102 and 1110 (NS 32-40-50) the front end pieces can be rotated by 360°, each DN 80 is rotatable by 45° (only in the factory adjustable).
Handle the cylinder so that no damage can occur to it. Protect the cylinder from falling objects, witch lead to the reduction of operational safety. Specified limits have to be observed. Respect the predominant environmental conditions. Following points should be observed, when installing the cylinders:

Media
Compressed air (oiled or unoiled)	Type: 1101 / 1102 / 1108 / 1110 / 1120 / 1122
Liquid (on request)	Type: 1101 / 1102 / 1108 / 1110 / 1120 / 1122

If there is an aggressive proximity, then Type 1110 is to be used, after checking for compatibility with PP30GF.

Kink safety
Idle stroke length, load and cylinder attachment have to be consider, to prevent a bend and a kink of the plunger rod, in every idle stroke position.

Integrity to stacks and vibrations
All parts, attached or adherent to a cylinder, have to be fixed, so that they can resist a release by stacks, vibrations or similar.

Idle stroke end stop
Adjustable external idle stroke end stops have to be secured by fitting means.

Alignment
Seats must be formed in such a way, that a distortion of the cylinder in the built-in state is avoided. The cylinder must be installed in such a way, that accidentally lateral loads while operation will be avoided. Corresponding guide elements must be provided when lateral forces occur.

Clamping bolts
Clamping bots for cylinder and attachments must be so construed and mounted, so that it absorbs all predictable power. As far as possible, the screws have to be free of shear forces. Cylinders with foot mounting should have other ways of absorbing thrust forces, beyond the mounting screws. The claiming bolt must be able to accommodate the tilting effects.

Protection of piston rod and wiper ring
Piston rods should be protected to foreseeable damage, such as notches, scratches, as well as extreme soiling, etc. Notches and scratches as well as extreme soiling may result in increased erosion or rather to a fast destruction of the sealing elements.

Spring cylinders
Attention! Attend to the prestressing of the spring at the integration and the removal of the cylinders.
It is recommend closing the air discharge unit of a single-acting spring cylinder with a silencer, to counteract a danger by ejected air as well as an invasion of dirt.

Bringing into service
After installation, the system must be tested for tightness on the screw connections. For pressure tests, the cylinders can only be loaded at nominal pressure. In many cases, the use of a soft-start valve is advised, to avoid a jerky extension of the cylinders (high load at the piston rod). Make sure, that in the traversing range of the piston rod:
- No one grabs into the running direction of the moveable mass.
- Are no foreign items.
Generally the operating instructions of the machine-/appliance manufacturer must be followed while the startup.

Adjustments
All cylinders NS 32/40/50/80 are supplied as standard with an adjustable end of stroke damper. The end of stroke damper must be regulated by hand at the cylinder head and cover, so that the piston reaches the end position safe, but does not hit too hard. By cylinders without end of stroke damper must be paid attention, that the stroke of the piston gets avoided, by the construction of the attachment (for example extern damper). The cylinder speed can be regulated with the additional use of throttles- respectively one-way restrictors as well as quick exhaust valves.
Attention: Quick exhaust valves can reduce the effectiveness of the end of stroke damper considerable.

Service
Under normal operating conditions a largely maintenance-free operation is possible. Particular elements of the equipment are subjected to a natural wearing and have to be replaced after a reasonable time addicted to the operating conditions. The corresponding wear parts respectively spare parts packs are shown on the catalogue or are named upon request. When assembling the devices the **grease „Shell Cassida Grease EPS2"**should be used if possible. Joints and gaskets are subject to a business individual wearing, in which leaks could result in a zone entrainment. For this reason, the tightness must be checked at reasonable intervals. A gasket change must be done by suitable specialists or by the manufacturer. That counts especially for the montage of the cylinders. All filters within a control system must be emptied or cleaned regularly. During the installation of the oil-fog lubricators, oil must be refilled regularly! Dust deposits on heated surfaces are simple flammable. Clean the product regularly.

Demounting
Before the removal of the cylinder out of the installation or repair workings at the cylinder, the same one must be depressurized. The piston rod should be in a position, where the part to be moved is in a safe position or rather a fall is avoided.

Security advice
The cylinder inclusive their attached accessory parts like for example magnetic switches must be protected against falling parts. Damage of the pipe or the piston rod causes a reduction of safety. Damage at the built-on cylinder switches affects the control produces.

Spare parts

Types 1101/1122–DN12/16/20/25 are not removable.
Spare parts units behold graph for Type 1102, 1110 and 1120.

To switch joints and gaskets of the spare parts unit Type 1102 / 1110 /1120 NS 32 – 50:

- Release the grub screw on the cylinder bottom.
- Fixing cylinder liner and unscrew/remove cylinder bottom.

Attention! Do not release the Cylinder cover.

- Extract piston rod (**Attention!** Do not damage the bearing surface of the piston rod).

Piston rod seal:

- Annul and remove gasket-stiffening member with chamfered screwdriver out of cylinder cover.
- **(Do not damage the plastics!).**
- Insert gasket-stiffening member (1), (click in notch).
- Place production lubrication (**Shell Cassida Grease EPS2**).

Piston seal:

- Release the captivation (Nut).
- Remove and dissemble piston packet carefully.
- Remove piston seals with chamfered screwdriver out of the piston.
- Slip new piston seal lips (2/3) carefully over the piston.
- – Attend the direction of the seal lips –
- Consider the order at the assembly:
- Sealing disc – spring – disc – 1. Part piston packet – O-ring (4) – (if present, magnetic disc) – 2. Part piston packet – disc – captivation with spring and sealing disc.
  (Watch position of the piston disc (sealing face to the outside)).
- Retain captivation (Nut) with LOCTITE 274 screws locking varnish.
- Place production lubrication (Shell Cassida Grease EPS2).
- Insert the piston rod carefully again (do not damage the plunger rod lining).
- Change O-ring (5) at the cylinder bottom.
- Screw on the cylinder bottom.
- Screw in the grub screw at the cylinder bottom.

To switch seals of the spare parts unit Type 1110 NS 80:

- Release and remove hulls at tie rod.
- Remove the cylinder bottom from the pipe.
- Extract the piston rod (Attention! Do not damage the bearing surface of the piston rod).
- Remove the cylinder cover from the Pipe.

Piston rod seals:

- Annul and remove piston rod seal (1) with chamfered screwdriver out of cylinder cover.
- (Do not damage the synthetics!).
- Insert piston rod seal, (click in notch).
- Place production lubrication (Shell Cassida Grease EPS2).

Absorber ring:

- Annul and remove absorber ring with chamfered screwdriver out of cylinder cover and cylinder bottom.
- (Do not damage the synthetics!).
- Insert absorber ring (2/6).
- Place production lubrication (Shell Cassida Grease EPS2).

Piston packet:

- Release the captivation (Nut) (Use face spanner pin ø3).
- Remove piston packet (4) carefully.
- Insert new piston packet (4).
- Place production lubrication (Shell Cassida Grease EPS2).
- Retain and bolt the captivation (Nut) down with LOCTITE 274 screws locking varnish
  (Use face spanner pin ø3).

O-Rings:

- Change O-Ring (5/3) at the cylinder bottom and cover.

Assembly:

- Insert the piston rod carefully in the cylinder cover again (do not damage the piston rod seal).
- Insert the piston rod carefully in the cylinder pipe (do not damage the piston seal).
- Put the cylinder cover and bottom on the pipe.
- Insert tie rod and bolt the tie rod down over cross with the (with LOCTITE 274 screws locking varnish) secured hulls.