Selection diagram

WITH PLUNGER DIRECT ACTION

D05   D06   D08   D09   D10

D12 external rubber gasket   D15   D17   D18   D19

WITH LEVER DIRECT ACTION

D40   D42   D45   D47   D53   D59

WITH LEVER INVERTED ACTION

R40   R42   R45   R47   R53   R59

WITH LEVER BACK DIRECT ACTION

F40   F42   F45   F47   F53   F59

ACTUATORS

1 1NO+1NC snap action

2 1NO snap action (on request)

3 1NC snap action (on request)

TERMINALS

V screw terminals with self-lifting plate

H 6.3 mm vertical faston

F faston 6.3 mm right bending of 45°

G faston 6.3 mm left bending of 45° (on request)

Code structure

article   options

MK **V12D40**-GR16T6

Terminals type

V	screw terminals with self-lifting late
H	vertical faston terminals
F	with faston, right bending of 45°
G	with faston, left bending of 45° (on request)

Contact block

1	1NO+1NC, snap action
2	1NO, snap action (on request)
3	1NC, snap action (on request)

Max protection degree

1	IP40 (with protection)
2	IP65 (with protection)

Actuation type

D	direct action
R	inverted action
F	back direct action

Ambient temperature

	-25°C ... +85°C (standard)
T6	-40°C ... +85°C

Suffix

	no suffix (standard)
R16	Ø 9.5x4 mm metal roller (for actuator 40, 42 .45 47, 53, 59)
R10	Ø 9.8x8.4 mm polymer roller (for actuator 40, 42 .45, 53)

Contacts type

	silver contacts (standard)
G	silver contacts gold plated 1 µm

Actuator

01	with pin
02	with pin
03	with small push button
..	....
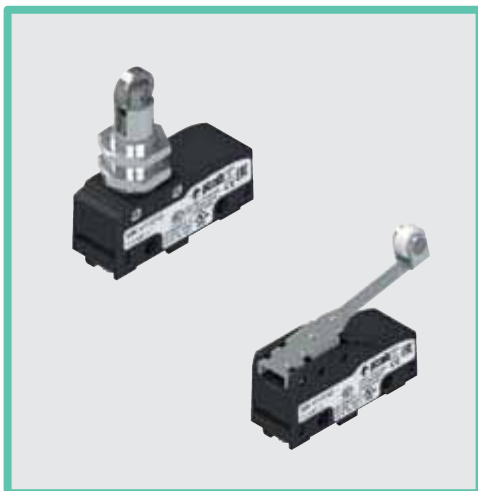
Main data

- Polymer housing
- Protection degree IP20, IP40 or IP65
- 4 terminal types available
- Versions with positive opening ⊖
- Silver contacts gold plated versions
- Terminal covers with wire trap cable gland

Markings and quality marks:

CE   c(UL)us   (CCC)s   EHC

Approval IMQ: in progress
Approval UL: E131787
Approval CCC: 2013010305604291
Approval EAC: RU C-IT ДМ94.B.01024

Technical data

Housing
Made of glass-reinforced polymer, self-extinguishing, shock-proof thermoplastic resin.
Protection degree according to EN 60529: IP00 (without protection)
IP20 (with protection VF C01 - VF C03)
IP40 (with protection VF MKC•1• - VF C02)
IP65 (with protection VF MKC•22 - VF MKC•23)

General data
Ambient temperature: -25°C ... +85°C
Max operating frequency: 3600 operations cycles[1]/hour
Mechanical endurance: 10 million operations cycles[1]
Driving torque for installation: see page 126
(1) One operation cycle means two movements, one to close and one to open contacts, as foreseen by EN 60947-5-1 standard.

Cross section of the conductors (flexible copper wire)
MK series: min. 1×0.34 mm^2 (1 x AWG 22)
max 2×1.5 mm^2 (2 x AWG 16)

In conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, EN 60529, EN 60529.
Approvals:
UL 508

In conformity with requirements requested by:
Low Voltage Directive 2006/95/EC, Machinery Directive 2006/42/EC and
EMC Directive 2004/108/EC.
Positive contact opening in conformity with standards:
IEC 60947-5-1, EN 60947-5-1, EN 60947-1, VDE 0660-206.

Installation for safety applications:
Use only switches marked with the symbol ⊖. The safety circuit must always be connected with the **NC contacts** (normally closed contacts) as stated in the **standard ISO 14119, par. 5.4**. The switch must be actuated with **at least up to the positive opening travel (FAP)** near the code article. The switch must be actuated **at least with the positive opening force (CAP)**, near the code article.

Electrical data

Thermal current (Ith):	16 A
Rated insulation voltage (Ui):	250 Vac 300 Vdc
Rated impulse withstand voltage (U_{imp}):	4 kV
Conditional shot circuit current:	1000 A according to EN 60947-5-1
Protection against short circuits:	fuse 16 A 250 V type gG
Pollution degree:	3
Dielectric strength	2000 Vac/min.

Utilization categories

Alternate current: AC15 (50 ... 60 Hz)

Ue (V)	250	120	
Ie (A)	4	6	

Direct current: DC13

Ue (V)	24	125	250
Ie (A)	5	0.5	0.3

Data type approved by UL

| Utilization categories	Q300 (69 VA, 125-250 Vdc)
	A300 (720 VA, 120-300 Vac)

In conformity with standard: UL 508

Please contact our technical service for the list of approved products.

Contact block reliability

The electrical contact on new microswitch has been realized with higher reliability technology, thanks to the double and redundant shape

For high quantity it's possible to supply the microswitch only with the contact NO or NC, in order to minimize purchase costs.
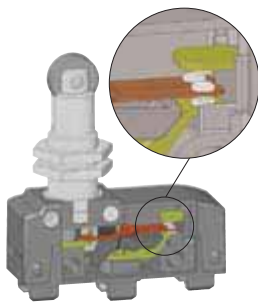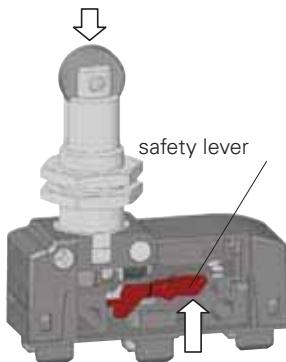
Protection degree IP65

IP65

The housing of the new microswitch provides the possibility to seat gaskets in order to seal the device against fine dusts or liquids up to IP65 degree. To obtain the protection degree match the appropriate version of the microswitch IP65 with the IP65 terminal cover.

Microswitches for safety applications

safety lever

All microswitches that have the symbol beside the code are with positive opening, therefore suitable for safety applications.

These microswitches are provided with a rigid connection between push button and NC contacts, which are opened by force through a strong/sturdy internal safety lever.

The positive opening has been realised in conformity with the standard IEC 60947-5-1, enclosure K, therefore these microswitches are suitable for the installation for people's protection.

Clamping screw plates for different diameter cables (MK V•)

These clamping screw plates have a particular "roofing tile" structure and are connected loosely to the clamping screw. In this way, during the wires fixing, the clamping screw plate is able to suit to cables of different diameter (see picture) and tends to tighten the wires toward the screw instead of permitting them to escape towards the outside.

EN 81-20 standard

- Safaty contacts according to EN 60947-5-1, encl. K.
- Protection degree higher than IP4x.
- Mechanical endurance higher than 10^6 cycles.

Terminal covers with wire trap cable gland, side by side installable

New terminal covers supplied with wire trap cable gland are provided for the protection degree up to IP65. These terminal covers are snap-in assembled and they have small dimensions in the microswitch profile, it's possible to install them also on microswitches fixed side by side.
See page 55.
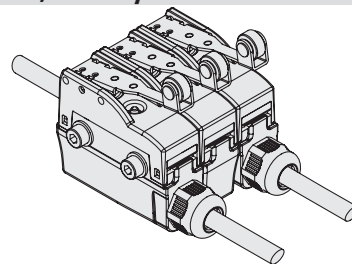
Terminals outline dimension
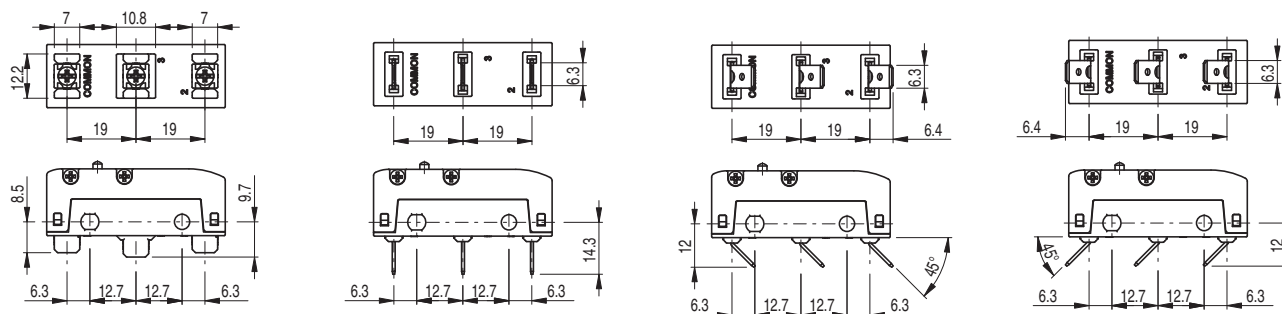
Screw terminals **V** with plate
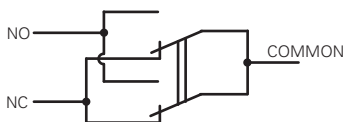
Vertical faston **H** terminals

faston terminals **F**, right bending

faston terminals **G**, left bending (on request)

Note: H vertical faston terminals can be bent according to one's installation requirements.
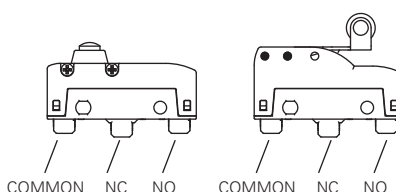We recommend to bend the faston with an angle not higher than 45° and to carry out this operation no more than 5 times.
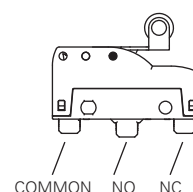
Wire diagram

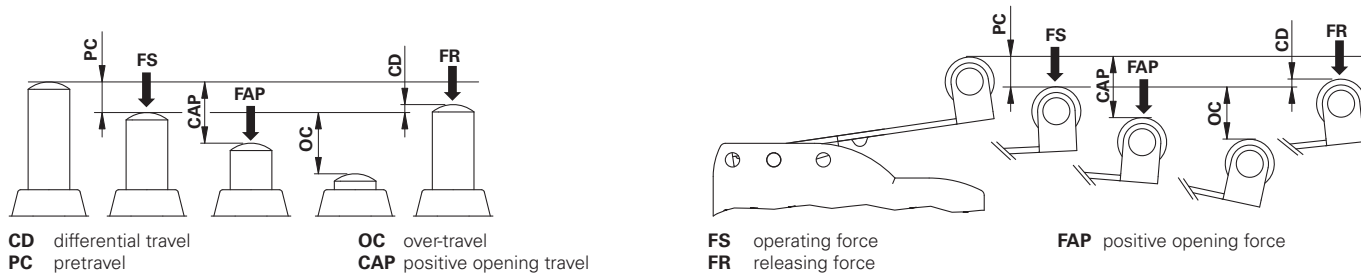NO
NC
COMMON

Contacts with single interruption and double contacts

With direct and back direct action (F, D)

COMMON   NC   NO

COMMON   NC   NO

With inverted action (R)

COMMON   NO   NC

Legend

CD differential travel
PC pretravel

OC over-travel
CAP positive opening travel

FS operating force
FR releasing force

FAP positive opening force

Microswitches with direct action (All measures in the drawings are in mm)

10 pcs packs

MK V11D05 → 1NO+1NC

PC	0.5 mm	FS	4 N
OC	2 mm	FR	3 N
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 1

MK V11D06 → 1NO+1NC

PC	0.5 mm	FS	4 N
OC	3 mm	FR	3 N
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 1

MK V11D08 → 1NO+1NC

PC	0.5 mm	FS	4 N
OC	5.5 mm	FR	3 N
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 1

MK V11D09 → 1NO+1NC

PC	0.5 mm	FS	4 N
OC	5.5 mm	FR	3 N
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 1

MK V11D10 → 1NO+1NC

PC	0.5 mm	FS	4 N
OC	5.5 mm	FR	3 N
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 1

MK V11D12 → 1NO+1NC

PC	0.5 mm	FS	4.5 N
OC	5.5 mm	FR	3 N .
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 1

Fixed only by threaded head

MK V11D15 → 1NO+1NC

PC	0.5 mm	FS	4 N
OC	5.5 mm	FR	3 N .
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 2

MK V11D17 → 1NO+1NC

PC	0.5 mm	FS	4 N
OC	5.5 mm	FR	3 N
CD	0.05 mm	FAP	20 N
CAP	2.2 mm		

Max and min. speed page 126 - type 2

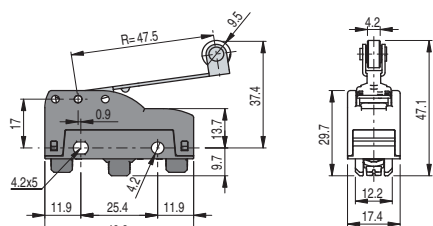Items with code on the **green** background are available in stock
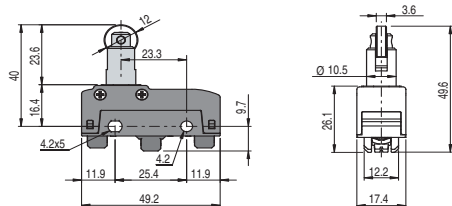
MK V11D18 1NO+1NC	PC 0.5 mm OC 5.5 mm CD 0.05 mm CAP 2.2 mm	FS 4 N FR 3 N . FAP 20 N
Max and min. speed page 126 - type 2		
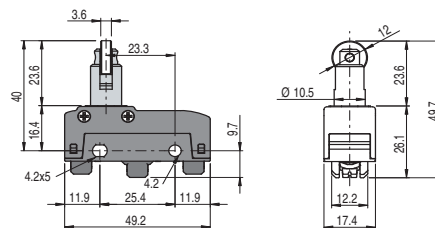
MK V11D19 1NO+1NC	PC 0.5 mm OC 5.5 mm CD 0.05 mm CAP 2.2 mm	FS 4 N FR 3 N FAP 20 N
Max and min. speed page 126 - type 2		

MK V11D40 1NO+1NC	PC 6.7 mm OC 7.8 mm CD 0.8 mm	FS 0.86 N FR 0.66 N
Max and min. speed page 126 - type 6		
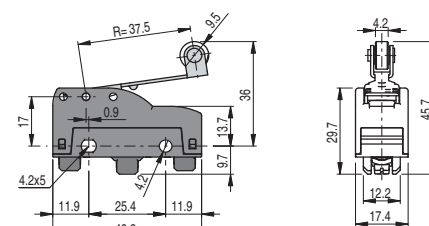
MK V11D42 1NO+1NC	PC 5..3 mm OC 5..7 mm CD 0..6 mm	FS 1..09 N FR 0..84 N
Max and min. speed page 126 - type 6		

MK V11D45 1NO+1NC	PC 3.5 mm OC 4.5 mm CD 0.4 mm	FS 1.66 N FR 1.28 N
Max and min. speed page 126 - type 6		

It switches / It does not switch
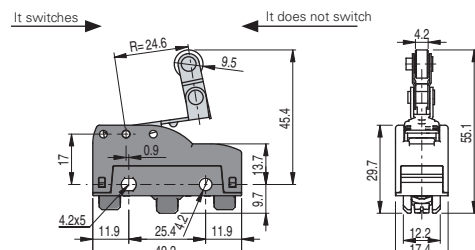
MK V11D47 1NO+1NC	PC 3.5 mm OC 4 mm CD 0.4 mm	FS 1.66 N FR 1.28 N
Max and min. speed page 126 - type 6		
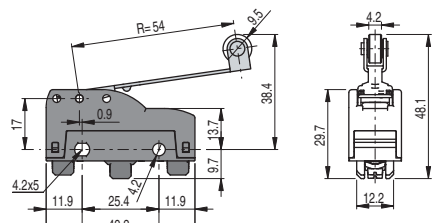
MK V11D53 1NO+1NC	PC 7.7 mm OC 8.9 mm CD 0.9 mm	FS 0.76 N FR 0.58 N
Max and min. speed page 126 - type 6		
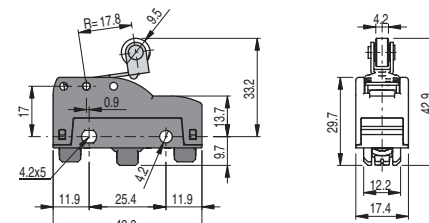
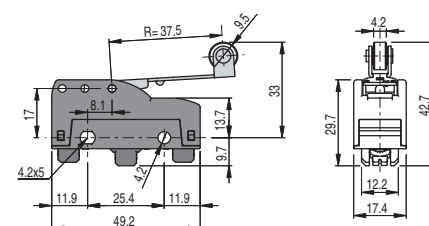| MK V11D59 1NO+1NC	PC 2.5 mm OC 4.5 mm CD 0.2 mm	FS 2.3 N FR 1.77 N
Max and min. speed page 126 - type 6		

Microswitches with inverted action (All measures in the drawings are in mm)
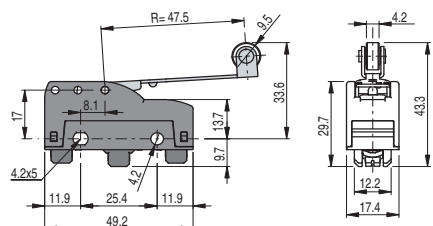
MK V11R40 1NO+1NC	PC 3.4 mm OC 10.3 mm CD 0.7 mm	FS 0.8 N FR 0.5 N
Max and min. speed page 126 - type 7		

MK V11R42 1NO+1NC	PC 2.7 mm OC 7.9 mm CD 0.5 mm	FS 1.2 N FR 1.7 N
Max and min. speed page 126 - type 7		

MK V11R45	1NO+1NC	PC	1.5 mm	FS	1.7 N
		OC	5.5 mm	FR	1 N
		CD	0.3 mm		

Max and min. speed page 126 - type 7

MK V11R47	1NO+1NC	PC	1.7 mm	FS	1.7 N
		OC	5.3 mm	FR	1 N
		CD	0.3 mm		

Max and min. speed page 126 - type 7

MK V11R53	1NO+1NC	PC	4.3 mm	FS	0.8 N
		OC	11.6 mm	FR	0.4 N
		CD	0.8 mm		

Max and min. speed page 126 - type 7

MK V11R59	1NO+1NC	PC	1.5 mm	FS	2.4 N
		OC	3.9 mm	FR	1.3 N
		CD	0.3 mm		

Max and min. speed page 126 - type 7

Microswitches with back direct action (All measures in the drawings are in mm) **10 pcs** packs

MK V11F40	1NO+1NC	PC	2.4 mm	FS	0.85 N
		OC	10.4 mm	FR	0.65 N
		CD	0.25 mm		

Max and min. speed page 126 - type 8

MK V11F42	1NO+1NC	PC	1.6 mm	FS	1 N
		OC	8.4 mm	FR	0.7 N
		CD	0.2 mm	FAP	4.9 N
		CAP	9 mm		

Max and min. speed page 126 - type 8

MK V11F45	1NO+1NC	PC	1.1 mm	FS	1.3 N
		OC	6.6 mm	FR	0.9 N
		CD	0.1 mm	FAP	6.9 N
		CAP	6.3 mm		

Max and min. speed page 126 - type 8

MK V11F47	1NO+1NC	PC	1.1 mm	FS	1.3 N
		OC	5.6 mm	FR	0.9 N
		CD	0.1 mm	FAP	6.9 N
		CAP	6.3 mm		

Max and min. speed page 126 - type 8

MK V11F53	1NO+1NC	PC	2.5 mm	FS	0.7 N
		OC	11.5 mm	FR	0.6 N
		CD	0.3 mm		

Max and min. speed page 126 - type 8

MK V11F59	1NO+1NC	PC	0.8 mm	FS	1.7 N
		OC	5.2 mm	FR	1.3 N
		CD	0.08 mm	FAP	8.9 N
		CAP	4.9 mm		

Max and min. speed page 126 - type 8

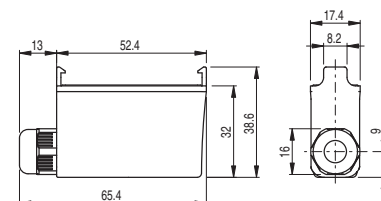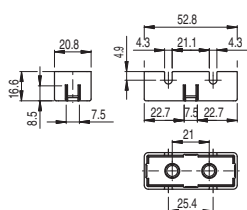## Protections (terminals covers)
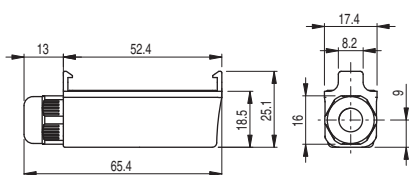
Protection terminal cover for screw terminals snap-in assembled and with wire trap cable gland. It allows the installation of more switches side by side.

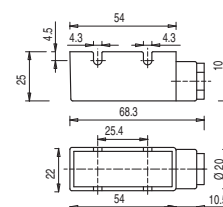| Article	Description	Protection degree
VF MKCV11	Protection terminal cover without gasket for multipolar cables from Ø 5 to Ø 7.5 mm	IP40
VF MKCV12	Protection terminal cover without gasket for multipolar cables from Ø 4 to Ø 7.5 mm	IP40
VF MKCV13	Protection terminal cover without gasket for multipolar cables from Ø 2 to Ø 5 mm	IP40
VF MKCV22	Protection terminal cover with gasket for multipolar cables from Ø 4 to Ø 7.5 mm	IP65
VF MKCV23	Protection terminal cover with gasket for multipolar cables from Ø 2 to Ø 5 mm	IP65

Protection terminal cover for vertical faston terminals snap-in assembled and with wire trap cable gland. It allows the installation of more switches side by side.
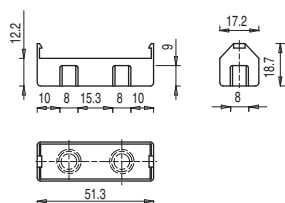
Article	Description	Protection degree
VF MKCH11	Protection terminal cover without gasket for multipolar cables from Ø 5 to Ø 7.5 mm	IP40
VF MKCH12	Protection terminal cover without gasket for multipolar cables from Ø 4 to Ø 7.5 mm	IP40
VF MKCH13	Protection terminal cover without gasket for multipolar cables from Ø 2 to Ø 5 mm	IP40
VF MKCH22	Protection terminal cover with gasket for multipolar cables from Ø 4 to Ø 7.5 mm	IP65
VF MKCH23	Protection terminal cover with gasket for multipolar cables from Ø 2 to Ø 5 mm	IP65

| Article	Description	Protection degree
VF C01	Protection terminal cover for screw terminals	IP20

| Article	Description	Protection degree
VF C02	Protection terminal cover for screw terminals with cable gland PG9 for multipolar cables from Ø 5 to Ø 7 mm	IP40

Article	Description	Protection degree
VF C03	Protection terminal cover for screw terminals snap-in assembled. It allows the installation of more switches side by side	IP20

Accessories
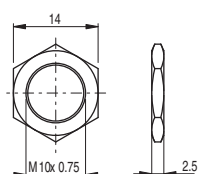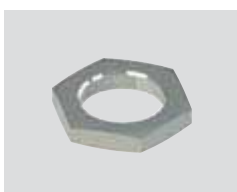
Article	Description
AC83	Hexagonal threaded nut M10 x 0.75 for microswitches
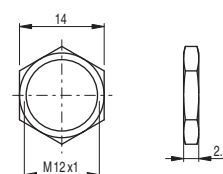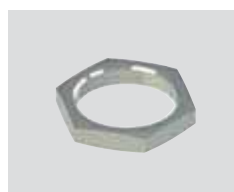
Article	Description
AC72	Hexagonal threaded nut M12 x 1 for microswitches

Items with code on the **green** background are available in stock

➜ 2D and 3D files available on **www.pizzato.com**