

## NORMACLAMP® – Hose Clamps

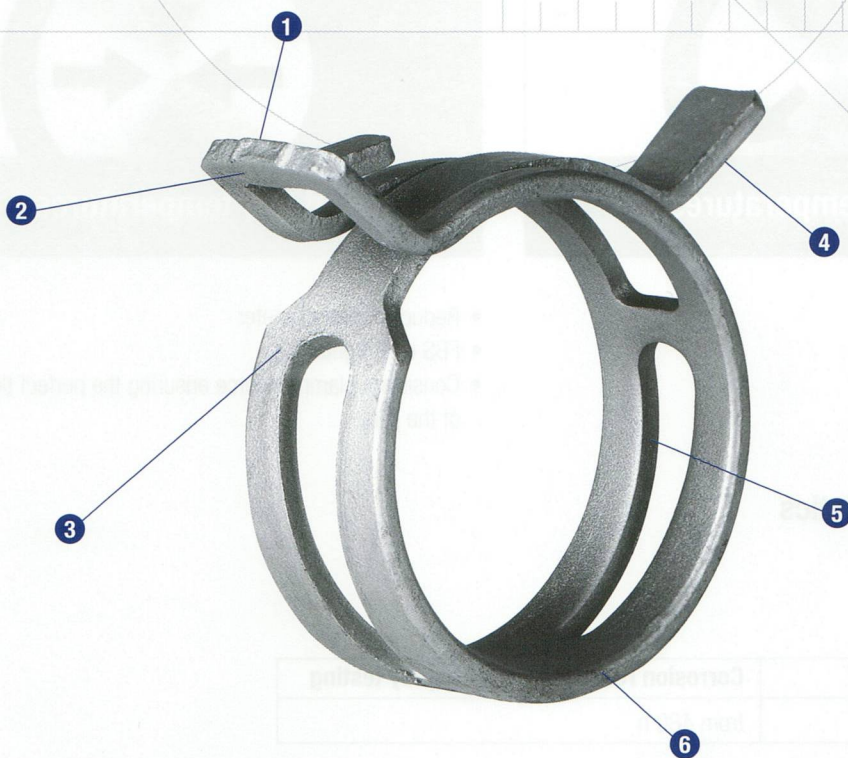
### NORMACLAMP® FBS – Springband hose clips to DIN 3021

Because of their design, NORMACLAMP® FBS springband hose clips are particularly suitable for use with hose-spigot connections which are submitted to extreme temperature changes.

Once assembled NORMACLAMP® FBS provide a continuously readjusting dynamic tightening effect.

Also at low temperatures the radially acting tightening force is sufficient to assure a reliable tightness of the system. Even hoses that are submitted to extreme temperature cycles, or those with a tendency to “creep” can be combined to form a safe connection when NORMACLAMP® FBS are used.

### Short description of technical features



- 1 Lot number stamped on clamp band = safe retraceability
- 2 NORMA® Logo = the visible sign for high quality
- 3 Organic/inorganic coating  
= optimal protection against corrosion  
Coating in different colour  
= improved engine design
- 4 Nominal diameter stamped on the clamp  
= prevention of mistakes
- 5 Special design = uniform distribution of clamping forces  
and optimal roundness
- 6 Round band edges  
= optimal hose protection

### Materials

C 75 S	Zinc-Aluminium Coating	Organic Coating
X	Basecoat	Topcoat

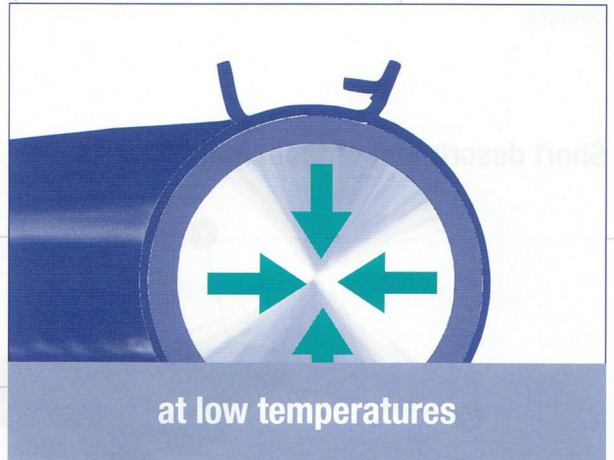
## NORMACLAMP® – Hose Clamps

### Short Description

- Dynamic hose clip
- Band material C 75 S
- Coating contains zinc – chromium VI-free
- Nominal diameter from 13 up to 80 mm – different gradations



- Expanding hose diameter
- FBS adapting to the hose



- Reduced hose diameter
- FBS is re-tightening
- Consistent clamping force ensuring the perfect tightness of the joint

### Technical characteristics

#### Corrosion resistance

Material	Corrosion resistance in salt spray testing
C 75 S	from 480 h

#### The advantages at a glance

- Single-part hose clips without screw
- Uniform distribution of clamping forces
- Optimal roundness
- Temperature resistance from – 40 °C up to 200 °C
- Unmistakable tracing due to lot numbering
- Visual control of nominal diameters by colour codes



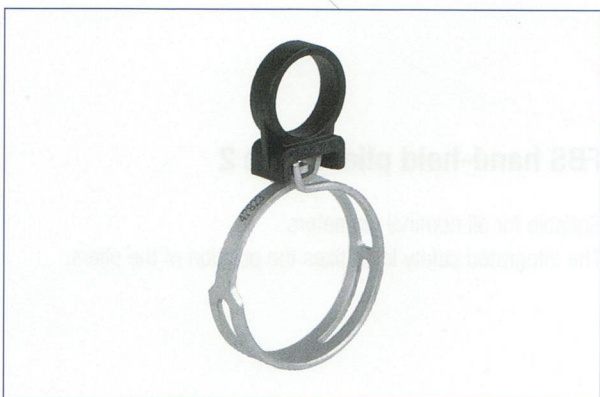
## NORMACLAMP® – Hose Clamps

### Variants



#### NORMACLAMP® FBS R

is a space-saving clamp. It was designed with the aim of realising the technical minimum overall height to allow its use in difficult assembly situations.



#### NORMACLAMP® FBS HC

is a pre-opened version secured by a plastic retaining clip. After slipping the clamp onto the hose, this clip can be easily removed by hand.



#### NORMACLAMP® FBS MC

is a pre-opened (and, if desired, pre-positioned) clamp secured by a small metal clip. The retaining clip for this version is removed by using pliers.



#### NORMACLAMP® FBS C

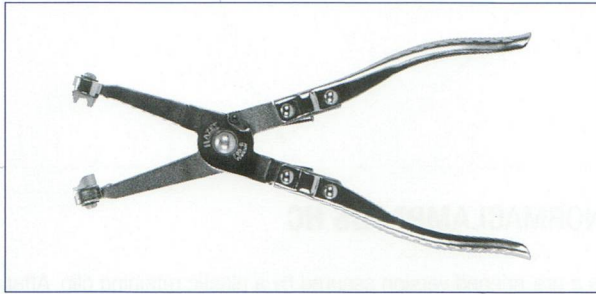
is a pre-opened clamp which is pre-positioned on the hose. The retaining mechanism for this version is an integral part of the clamp band.

## NORMACLAMP® – Hose Clamps

### NORMA®-Professional tooling

#### Hand-held pliers

For professional assembly operations we offer you a range of quality hand-held and pneumatic tools:



#### FBS hand-held pliers Type 1

Suitable for small diameters.



#### FBS hand-held pliers Type 2

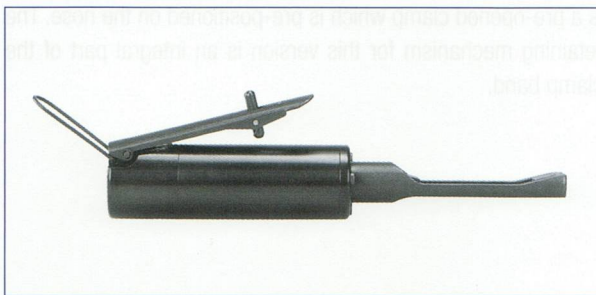
Suitable for all nominal diameters.  
The integrated safety lever fixes the position of the pliers.

#### Pneumatic tools



#### FBS pneumatic pliers Type "S"

Suitable for the assembly of FBS that are pre-positioned on the hose.



#### FBS pneumatic pliers Type "W"

Suitable for volume production.  
The clamp head is approached sideways.



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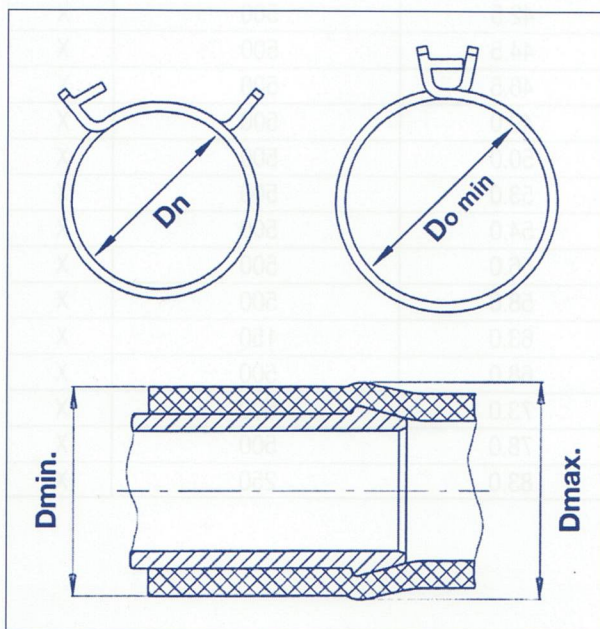
### Applications in the automotive industry

NORMACLAMP® FBS springband clips are specially suitable for use in applications where connections are under extreme cyclic temperature loads:

- Coolant and heating systems
- Fuel lines
- Airducts

In order to determine the correct size of clamp please proceed as follows:

1. Slide the hose onto the spigot and measure the  $D_{min}$  and  $D_{max}$ . (see diagram below)
2. From the  $D_{min}$  value determine the nominal diameter ( $D_n$ ) of the appropriate clamp.  
 **$D_n = D_{min}$ .**
3. Compare the  $D_{max}$  value with the stated minimum diameter of the open clamp and select the suitable clamp size.  
 **$D_{o min} \geq D_{max}$ .**



Samples can be provided on request. We shall be pleased to discuss your specific problem or application in detail. Just contact us.

## NORMACLAMP® – Hose Clamps

### Survey of sizes, band widths & materials NORMACLAMP® FBS

Band width (mm)	Description	D <sub>n</sub> in mm	D <sub>0</sub> min in mm	Packaging IC	C 75 S
12	FBS 13/12	13	14.5	3000	X
12	FBS 14/12	14	15.8	3000	X
12	FBS 15/12	15	16.8	3000	X
12	FBS 16/12	16	17.5	1000	X
12	FBS 17/12	17	18.5	3000	X
12	FBS 18/12	18	19.0	2500	X
12	FBS 19/12	19	21.0	2000	X
12	FBS 20/12	20	21.6	2000	X
12	FBS 21/12	21	22.5	1500	X
12	FBS 22/12	22	24.5	1500	X
12	FBS 23/12	23	24.7	1500	X
12	FBS 24/12	24	26.0	1000	X
12	FBS 25/12	25	27.0	1000	X
12	FBS 26/12	26	28.0	1000	X
12	FBS 27/12	27	29.0	1000	X
12	FBS 28/12	28	30.5	1000	X
12	FBS 29/12	29	31.5	1000	X
12	FBS 30/12	30	32.5	1000	X
12	FBS 32/12	32	34.5	1000	X
12	FBS 35/12	35	38.0	1000	X
12	FBS 36/12	36	39.0	1000	X
12	FBS 38/12	38	41.5	1000	X
12	FBS 40/12	40	42.5	500	X
12	FBS 42/12	42	44.5	500	X
12	FBS 44/12	44	46.5	500	X
12	FBS 46/12	46	49.0	500	X
12	FBS 47/12	47	50.0	500	X
12	FBS 50/12	50	53.0	500	X
12	FBS 51/12	51	54.0	500	X
12	FBS 53/12	53	56.0	500	X
12	FBS 55/12	55	58.0	500	X
12	FBS 60/12	60	63.0	150	X
12	FBS 65/12	65	68.0	500	X
12	FBS 70/12	70	73.0	500	X
12	FBS 75/12	75	78.0	500	X
12	FBS 80/12	80	83.0	250	X

#### Enquiries/ordering:

When making enquiries or placing orders please indicate as follows:

	1. Typ	2. Nominal diameter	3. Band width
Example	FBS	13/	12