



CF77.UL.D       PUR       6.8       -25/+80       Max ? ⇒ III € € ? ⊇ [ € €        ✓       180       60       370         CFROBOT2       PUR       ✓       10       -25/+80       Mar ? ⇒ III € € ? ⊇ ( €        ✓       ✓       180       60       374         Data cables       CFROBOT3       PUR       ✓       10       -25/+80       Mar ? ⇒ III € © ? ⊇ ( €        ✓       ✓       180       60       376         Bus cables       CFROBOT3       PUR       ✓       10       -25/+70       Mar ? ⇒ III € ? ? ⊇ ( €        ✓       ✓       180       60       376         Bus cables       CFROBOT8       PUR       ✓       10       -25/+70       Mar > III € ? ? ⊇ ( €        ✓       ✓       180       60       378         Measuring system cables       CFROBOT4       PUR       ✓       10       -25/+80       Mar ? ⇒ III € ? ⊇ ? ⊇ ( €        ✓       ✓       180       60       380         Fibre optic cables       CFROBOT5       TPE       10       -35/+80       A ? ? ⊇ ? ⊇ ? ⊆ ? ⊇ ? € €        ✓       ✓       180       60       384         Power cables/Servo cables       III < 25/+80       A ? ? = III € ? ⊇ ? ⊇ ? ⊆ ? ⊇ ? ⊆ €        ✓       ✓       18	oho		<b>.</b>		_® ♣							•
Twistable cables       362         Information twistable cables       362         Exclusive! chainflex® guarantee – guaranteed lifetime       > Selection table page 364         Hybrid cables/Control cables       Selection table page 364         CFROBOT9       PUR       ✓       10       -25/+80       Ala ?       Iff @ ? •       C ? •       ✓       180       60       366         CFROBOT9       PUR       ✓       10       -25/+80       Ala ?       Iff @ ? •       Iff @ ? •       ✓       180       60       370         CFROBOT2       PUR       ✓       10       -25/+80       Ala ?       Iff @ ? •       Iff @ ? •       ✓       180       60       370         CFROBOT3       PUR       ✓       10       -25/+80       Ala ?       Iff @ ? •       Iff @ ? •       ✓       180       60       378         Bus cables       CFROBOT3       PUR       ✓       10       -25/+70       Ala ?       Iff @ ? •       Iff									ut			
Information twistable cables       Jaga         Exclusive! chainflex® guarantee – guaranteed lifetime       Selection table page 364         Hybrid cables       Selection table page 364         CFROBOT9       PUR       ✓       10       -25/ +80       Ala ?       Iff @ ? ? ? ? ? ? ? ?        ✓       180       60       370         CFROBOT2       PUR       ✓       10       -25/ +80       Ala ?       Iff @ ? ? ? ? ? ? ? ? ?        ✓       180       60       370         CFROBOT2       PUR       ✓       10       -25/ +80       Ala ?       Iff @ ? ? ? ? ? ? ? ? ?        ✓       180       60       370         CFROBOT2       PUR       ✓       10       -25/ +80       Ala ? ? Iff @ ? ? ? ? ? ? ? ? ? ? ?        ✓       ✓       180       60       370         Data cables         10       -25/ +80       Ala ? ? Iff @ ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ? ?	chainflex <sup>®</sup> cab	Jacket	Shield	Bending radiu: twisted, min. [factor x d]	Temperature twisted from/to [°C]	Approvals and standards		Oil resistant	Torsion resista	v max. twisted [°/s]	a max. twisted [°/s <sup>2</sup> ]	Page
Exclusive! chainflex* guarantee - guaranteed lifetime <ul> <li>Selection table pages 364</li> <li>Hybrid cables/Control cables</li> </ul> CFROBOT9       PUR <ul> <li>10</li> <li>25/480             <li>Ala             <li>Iff</li> <li>Iff<td>Twistable ca</td><td>ables</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></li></li></li></ul>	Twistable ca	ables										
Hybrid cables/Control cables         CFROBOT9       PUR       ✓       10       -25/+80       Man </th III<       C       ✓       180       60       366         CFROBOT9       PUR       ✓       10       -25/+80       Man?       III       C       ✓       ✓       180       60       366         CFROBOT2       PUR       ✓       10       -25/+80       Man?       III       C       ✓       ✓       180       60       370         Data cables         CFROBOT3       PUR       ✓       10       -25/+80       Man?       III       C       ✓       ✓       180       60       370         Data cables         CFROBOT3       PUR       ✓       10       -25/+80       Man?       III       C       ✓       ✓       180       60       378         Bus cables         CFROBOT4       PUR       ✓       10       -25/+70       Man?       III       C       ✓       ✓       180       60       378         Measuring system cables         CFROBOT5	Information to	wistabl	e cab	les								362
CFROBOT9       PUR       ✓       10       -25/+80       Man ♡       FII © © ♡       C €       ✓       180       60       366         CF77.UL.D       PUR       ✓       10       -25/+80       Man ♡       FII © © ♡       C €       ✓       ✓       180       60       370         CFROBOT2       PUR       ✓       10       -25/+80       Man ♡       FII © © ♡       C €       ✓       ✓       180       60       370         Data cables        ✓       10       -25/+80       Man ♡       FII © © ○       C €       ✓       ✓       180       60       370         Data cables        ✓       10       -25/+80       Man ♡       FII © © ○       C €       ✓       ✓       180       60       376         Bus cables        ✓       10       -25/+70       Man ♡       FII © © ○       C €       ✓       ✓       180       60       378         Measuring system cables       ✓       10       -25/+70       Man ♡       FII © © ○       C €       ✓       ✓       180       60       380         Fibre optic cables       ✓       10       -25/+80       Man ♡       <	Exclusive! ch	ainflex	® gua	rantee	– guaran	teed lifetime	I	► Sele	ection	table	page	364
CF77.UL.D       PUR       6.8       -25/+80       Alla ? ● [H] € ② ? ■ [C € ? · · · 180 60 370         CFROBOT2       PUR        10       -25/+80       Alla ? ● [H] € ③ ? ■ [C € ? · · · 180 60 374         Data cables       CFROBOT3       PUR        10       -25/+80       Alla ? ● [H] € ③ ? ■ [C € ? · · · 180 60 376         Bus cables       CFROBOT3       PUR        10       -25/+80       Alla ? ● [H] € ③ ? ■ [C € ? · · · 180 60 376         Bus cables       CFROBOT8       PUR        10       -25/+70       Alla ? ● [H] € ③ ? ■ [C € ? · · · 180 60 378         Measuring system cables       CFROBOT4       PUR        10       -25/+70       Alla ? ● [H] € ③ ? ■ [C € ? · · · · 180 60 380         Fibre optic cables       III • ·25/+80       Alla ? ● [H] € ③ ? ■ [C € ? ● ] ○ [C € · · · · · 180 60 384         Fibre optic cables       III • ·25/+80       Alla ? ● [H] € ③ ? ■ [C € ? • · · · 180 60 384         Power cables/Servo cables       III • ·25/+80 Alla ? ● [H] € ③ ? ■ [C € ? • · · · 180 60 386         CFROBOT5       TPE 10 -35/+80 Alla ? ● [H] € ③ ? ■ [C € ? ● [C € · · · · 180 60 386         CFROBOT6       PUR 1 0 -25/+80 Alla ? ● [H] € ③ ? ■ [C € ? ● [C € · · · · 180 60 386         CFROBOT6       PUR 1 0 -25/+80 Alla ? ● [H] € ③ ? ■ [C € ? ● [C € · · · · 180 60 386	Hybrid cable	es/Con	trol c	ables								
CFROBOT2       PUR       ✓       10       -25/+80       Alle ♥       FII ♥ ♥ ♥       ○ € ♥       ✓       180       60       374         Data cables         CFROBOT3       PUR       ✓       10       -25/+80       Alle ♥       FII ♥ ♥ ♥       ○ € ♥       ✓       180       60       376         Bus cables       ✓       10       -25/+80       Alle ♥       FII ♥ ♥ ♥       ○ € ♥       ✓       180       60       376         Bus cables       ✓       10       -25/+70       Alle ♥       ○ ♥ ♥ ● ● € ♥ ● ● € ♥       ✓       ✓       180       60       376         CFROBOT8       PUR       ✓       10       -25/+70       Alle ♥ ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ● ●	CFROBOT9	PUR	$\checkmark$	10	-25/ +80	AL 🤊 😑 III 🕒 E	e 🔊 🔤 🗾 C E	$\checkmark$	$\checkmark$	180	60	366
Data cables         CFROBOT3       PUR       ✓       10       -25/+80       Amo ?       FIL C ?       ✓       ✓       180       60       376         Bus cables         10       -25/+70       Amo ?       FIL C ?       ✓       ✓       180       60       376         Bus cables         10       -25/+70       Amo ?       FIL C ?       ✓       ✓       180       60       376         Measuring system cables         10       -25/+80       Amo ?       FIL C ?       ✓       ✓       180       60       376         CFROBOT4       PUR       ✓       10       -25/+80       Amo ?       FIL C ?       ✓       ✓       180       60       380         Fibre optic cables         10       -25/+80       Amo ?       FIL C ?       ✓       ✓       180       60       384         Power cables         10       -35/+80       Amo ?       FIL C ?       ✓       ✓       ✓       180       60       386         CFROBOT6       PUR        10       -25/+80       Amo ?       FIL C ?       ✓ <td< td=""><td>CF77.UL.D</td><td>PUR</td><td></td><td>6.8</td><td>-25/ +80</td><td>AL 🤊 😑 III 🕒 E</td><td>; 🔊 🔤 🌆 C E</td><td><math>\checkmark</math></td><td><math>\checkmark</math></td><td>180</td><td>60</td><td>370</td></td<>	CF77.UL.D	PUR		6.8	-25/ +80	AL 🤊 😑 III 🕒 E	; 🔊 🔤 🌆 C E	$\checkmark$	$\checkmark$	180	60	370
CFROBOT3       PUR       ✓       10       -25/+80       Nas ♥       FIL ♥ ♥       C €       ✓       ✓       180       60       376         Bus cables       CFROBOT3       PUR       ✓       10       -25/+70       Nas ♥       FIL ♥ ♥       ○ €       ✓       ✓       180       60       378         Measuring system cables       I       0       -25/+70       Nas ♥       FIL ♥ ♥       ○ €       ✓       ✓       180       60       378         Measuring system cables       I       0       -25/+80       Nas ♥       FIL ♥ ♥       ○ €       ✓       ✓       180       60       380         Fibre optic cables       I       0       -25/+80       Nas ♥       FIL ♥ ♥       ○ €       ✓       ✓       180       60       380         Fibre optic cables       I       0       -35/+80       Nas ♥       III ♥       ✓       180       60       384         Power cables/Serve cables       I       10       -25/+80       Nas ♥       III ♥       €       ✓       ✓       I80       60       386         CFROBOT6       PUR       I       10       -25/+80       Nas ♥       III ♥       E	CFROBOT2	PUR	$\checkmark$	10	-25/ +80	AL 🤊 😑 III 🕒 🏵	e 💎 🔤 🚺 C E	$\checkmark$	$\checkmark$	180	60	374
Bus cables         CFROBOT8       PUR       ✓       10       -25/ +70       Alis       ○       IR       ○       ✓       180       60       378         Measuring system cables       CFROBOT4       PUR       ✓       10       -25/ +80       Alis       ○       IR       ○       ○       ✓       180       60       380         Fibre optic cables       I       0       -25/ +80       Alis       ○       IR       ○       ○       ○       ○       I80       60       380         Fibre optic cables       I       0       -25/ +80       Alis       ○       IR       ○       ○       ○       ○       I80       60       384         Power cables/Servo cables       I       0       -35/ +80       Alis       ○       IR       ○       ○       I80       60       384         CFROBOT6       PUR       10       -25/ +80       Alis       ○       IR       ○       ○       I80       60       386         CFROBOT6       PUR       10       -25/ +80       Alis       ○       IR       ○       I80       ○       I80       60       386       I80       ○       I80<	Data cables											
CFROBOT8       PUR $\checkmark$ 10 $-25/+70$ $\Lambda_{18}$ $\square$ <	CFROBOT3	PUR	✓	10	-25/ +80	AL 🤊 😑 🖽 🕒 @	; 🔊 🔤 🛽 CE	$\checkmark$	✓	180	60	376
Measuring system cables         CFROBOT4       PUR $\checkmark$ 10 $-25/+80$ $\mathbb{A}_{\mathbb{B}}$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\checkmark$ $180$ $60$ $380$ Fibre optic cables         CFROBOT5       TPE       10 $-35/+80$ $\mathbb{A}_{\mathbb{B}}$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\checkmark$ $\checkmark$ $180$ $60$ $384$ Power cables/Servo cables         CFROBOT6       PUR       10 $-25/+80$ $\mathbb{A}_{\mathbb{B}}$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\checkmark$ $180$ $60$ $386$ CFROBOT6       PUR       10 $-25/+80$ $\mathbb{A}_{\mathbb{B}}$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\checkmark$ $\checkmark$ $180$ $60$ $386$ CFROBOT7       PUR $\checkmark$ 10 $-25/+80$ $\mathbb{A}_{\mathbb{B}}$ $\bigcirc$ $\bigcirc$ $\bigcirc$ $\sim$ $\checkmark$ $180$ $60$ $388$	Bus cables											
CFROBOT4PURI $-25/+80$ $\mathbb{A}_{18}$ $\mathbb{P}$ $\mathbb{P}$ $\mathbb{C}$ $\mathbb$	CFROBOT8	PUR	✓	10	-25/ +70	AL 7 🖯 🕅 🗲 @	: 🤝 🔤 🚺 C E	$\checkmark$	✓	180	60	378
Fibre optic cablesCFROBOT5TPE10 $-35/+80$ $20$ $20$ $20$ $20$ $20$ $20$ $180$ $60$ $384$ Power cables/Servo cablesCFROBOT6PUR10 $-25/+80$ $20$ $20$ $20$ $20$ $20$ $20$ $20$ $180$ $60$ $386$ CFROBOT7PUR10 $-25/+80$ $20$ $20$ $20$ $20$ $20$ $20$ $20$ $180$ $60$ $388$	Measuring s	system	cable	es								
CFROBOT5TPE10 $-35/+80$	CFROBOT4	PUR	✓	10	-25/ +80	AL 🤊 😑 🕅 🕒 🤅	; 🔊 🔤 🛛 C E	$\checkmark$	$\checkmark$	180	60	380
Power cables/Servo cablesCFROBOT6PUR10 $-25/+80$ $\mathbb{A}_{18}$ $\mathbb{P}$ $\mathbb{P}$ $\mathbb{C}$ $\checkmark$ 18060386CFROBOT7PUR $\checkmark$ 10 $-25/+80$ $\mathbb{A}_{18}$ $\mathbb{P}$ $\mathbb{P}$ $\mathbb{C}$ $\checkmark$ 18060388	Fibre optic o	ables										
CFROBOT6PUR10 $-25/+80$ $\mathbb{A}_{18}$ $\mathbb{P}$ $\mathbb{P}$ $\mathbb{P}$ $\mathbb{C}$ $\mathbb{P}$ $\mathbb{C}$	CFROBOT5	TPE		10	-35/ +80		🐨 💷 C C	✓	$\checkmark$	180	60	384
CFROBOT7 PUR ✓ 10 -25/+80 ଲu 💬 📄 [][[ ] 🚱 இ 💬 🔤 💽 C € ✓ ✓ 180 60 388	Power cable	es/Serv	vo cal	oles								
	CFROBOT6	PUR		10	-25/ +80	AL 🍞 📄 [A] 🚱 @	; 🕬 📟 🔍 C E	$\checkmark$	✓	180	60	386
CFROBOT TPE 🗸 10 -35/+90 🗛 💎 😑 [f] 💽 🕼 🗸 🗲 🕻 🗸 🗸 180 60 392	CFROBOT7	PUR	✓	10	-25/ +80	AL 🤊 📄 [A] 🚱 🤅	e 💕 🔤 🔣 C E	✓	✓	180	60	388
	CFROBOT	TPE	✓	10	-35/ +90	AL 💎 📄 [fit 🚱 @	e 😿 🔤 🚺 C E	$\checkmark$	$\checkmark$	180	60	392

Ever more complex sequences of movements in industrial applications demand twistable and/or three-dimensional flexible cables with a long service life similar to the classic chainflex<sup>®</sup> cables for use in linear e-chainsystems<sup>®</sup>.

Wires, stranded, shields and sheathing materials must compensate both major changes in bending load and changes in diameter due to torsional movements. For this purpose, different "soft" structural elements e.g. rayon fibres, PTFE elements or filling elements that absorb torsion forces are used in chainflex® ROBOT cables.

Special demands are made on the braided shielding in torsion cables. Torsion-optimised shield structures are chosen that can carry out the necessary compensatory movements thanks to special PTFE gliding films.

With twistable bus cables in particular, the transmission characteristics such as attenuation, cable capacity and signal quality must remain within very tight tolerance ranges over the whole service life. This is achieved through the use of particularly torsionoptimised insulating materials and mechanical attenuation elements with matching capacity values.

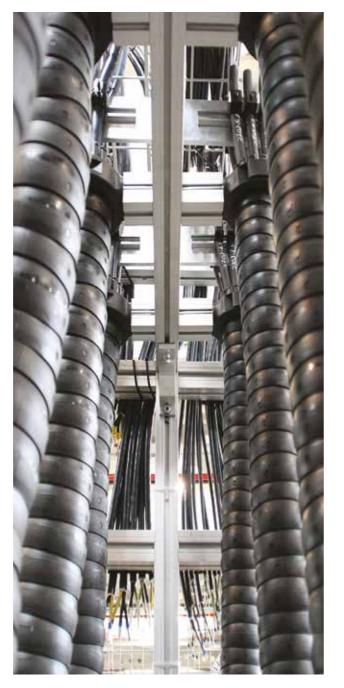
The highly abrasion-resistant, halogen-free and flameresistant PUR sheathing mixture in motor, hybrid/control cables and bus cables protects the torsion-optimised stranded elements from possible damage.

The highly abrasion-resistant, halogen-free TPE-sheath mixture matches the special requirements of the twistable FOC and individual wires, and also protects the stranded elements.

Unlike cables for linear e-chainsystems®, the "mechanical stress" for these cables is in the combination of bending, torsion and centrifugal forces that cannot usually be determined by design in advance or during use by means of measurement. For this reason, and unlike the situation with linear e-chain® applications, a clear "yes/no" statement cannot be made about the possibility of using a certain cable in torsion applications.

To enable evaluation to take place nevertheless, based on sensible and comparable test results, the igus® "torsion test standard" was developed.

According to this standard, all chainflex<sup>®</sup> ROBOT cables of a triflex® R energy chain® are twisted with a fixed-point distance of one metre and a torsion of +/- 180° at least 3 million times.



1,040 types from stock no cutting costs ...

chain length of approx. 2500 mm with 270° torsion with an extreme load through centrifugal forces and heavy blows such as those that can occur with an industrial robot.

All the non-shielded, gusset-filled extruded standard chainflex<sup>®</sup> control cables of the series CF130.UL, CF5, CF9 and CF9.UL correspond to the above-mentioned igus® standard and have been approved for use in torsion applications.

The following twistable CF ROBOT cable types are currently available:

We can also offer you chainflex® ROBOT cables prefitted with the plug-in connectors of your choice as readycable®, or as a ready-to-install readychain® cable assembly.



Test data ► Page 61

## ... no minimum order quantity ... igus<sup>®</sup> GmbH Cologne | Tel. +49(0)2203/9649-800 Fax -222 | info@igus.eu | www.chainflex.eu 363

(up to 10 cuts of the same types)

## chainflex® guarantee chainflex® Temperature, v max v max. [°/s]



# Guaranteed lifetime (1) Bending radius min. Bending radius min. Ben

	chainflex®	Temperature,			[factor x d]	[factor x d]
	cable	from/to [°C]	twisted	twisted		
Twistable cables					5 million cycles *	7.5 million cycles
		-25 / -15			±150	±90
TOTAL OF	CF ROBOT9	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-25 / -15			±150	±90
	CF77.UL.D	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-25 / -15			±150	±90
	CF ROBOT2	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-25 / -15			±150	±90
	CF ROBOT3	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-25 / -15			±150	±90
	CF ROBOT8	-15 / +60	180	60	±180	±120
		+60 / +70			±150	±90
		-25 / -15			±150	±90
	CF ROBOT4	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-25 / -15			±150	±90
	CF ROBOT5	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-25 / -15			±150	±90
	CF ROBOT6	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-25 / -15			±150	±90
	CF ROBOT7	-15 / +70	180	60	±180	±120
		+70 / +80			±150	±90
		-35 / -25			±150	±90
	CF ROBOT	-15 / +80	180	60	±180	±120
		+80 / +90			±150	±90
	<sup>(1)</sup> Exclusive! Guarante		according to the g	uarantee conditions ► Page 22-25	* Guaranteed lifetime, higher number	

<sup>(1)</sup> Exclusive! Guaranteed lifetime for this series according to the guarantee conditions ► Page 22-25

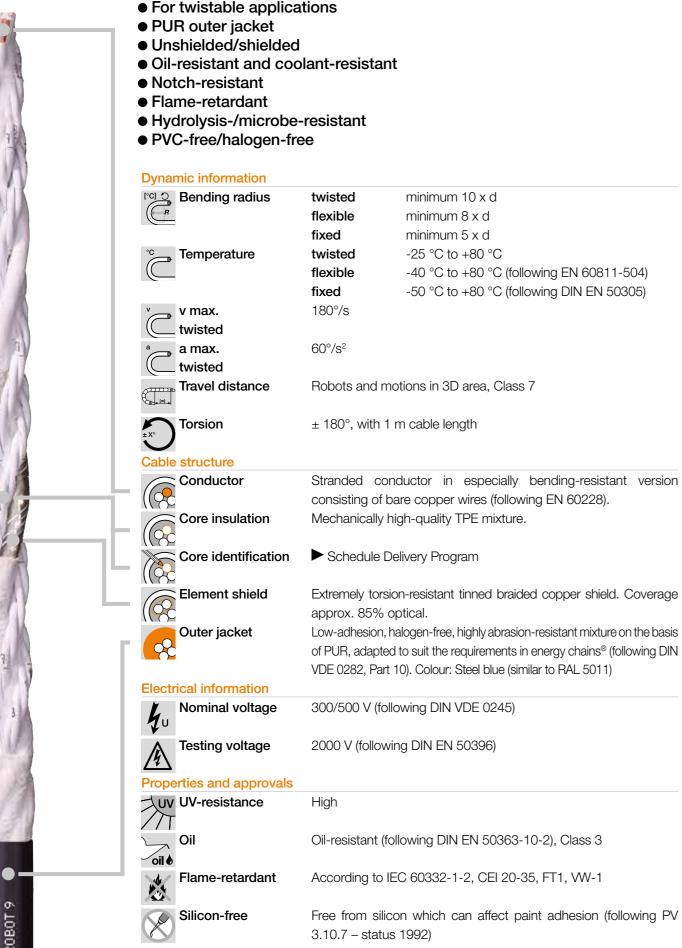
\* Guaranteed lifetime, higher numbers of double strokes possible.



nin.	Bending radius min. [factor x d]	Page
es *	10 million cycles *	
	±30	
	±60	366
	±30	
	±30	
	±60	370
	±30	
	±30	
	±60	374
	±30	
	±30	
	±60	376
	±30	
	±30	
	±60	378
	±30	
	±30	
	±60	380
	±30	
	±30	
	±60	384
	±30	
	±30	
	±60	386
	±30	
	±30	000
	±60	388
	±30	
	±30	
	±60	392
	±30	

#### CFROBOT9 PUR ± 180°

## PUR Hybrid cable, twistable | CFROBOT9



## 1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

## Class 6.7.3

Halogen-free

UL/CSA

Hal

NFPA NFPA

EHE EAC

CEI

**CE** <sup>CE</sup>

Ê

CTP

RoHS- Lead free

Clean room

Following EN 50	267-2-1
$\leq$ 0.5 mm <sup>2</sup> : > 0.5 mm <sup>2</sup> : Following NFPA	Style 10493 and
Certified accord	ing to No. TC RL
Certified accord	ing to No. C-DE.
Following CEI 20	)-35
Following 2011/	65/EC (RoHS-II)
According to IS CF27.07.05.02.0 Following 2006/9	01.D, tested by IF

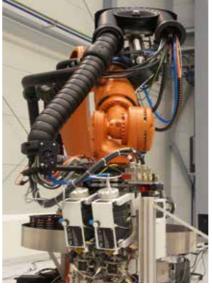
### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature, from/to [°C]	v max. [°/s] twisted	a max. [°/s²] twisted	Torsion max. [°/m]	Torsion max. [°/m]	Torsion max. [°/m]
-25 / -15			±150	±90	±30
-15 / +70	180	60	±180	±120	±60
+70 / +80			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives



igus® chainflex® cables in application of a multi-dimensional moving energy chain triflex® R for 6-axis robots.

## ... no minimum order quantity ...

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CFROBOT9 PUR ± 180°

nd 20317, 300 V, 80 °C nd 20317, 300 V, 80 °C er 12.9

U C-DE.ME77.B.01254

.PB49.B.00416

iter jacket material complies with PA according to standard 14644-1.



## PUR Hybrid cable, twistable | CFROBOT9

### IGUS" CHAINFLEX" CF ROBOT 9

Image exemplary.							
Delivery program Part No.	Number of cores and conductor nominal cross section [mm <sup>2</sup> ]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Core group	Colour code
CFROBOT9.001	5 G 1.0 + (2 x 1.0)C	10.5	86	142	CFROBOT9.001	5G1.0 (2x1.0)C	Cores black with w Cores white with bla
CFROBOT9.002	2x3x0.75 + (3x0.75)C	11.5	82	145	CFROBOT9.002	2x3x0.75 (3x0.75)C	Cores white with bla Cores white with bla
CFROBOT9.003	2x0.5 + (2x0.5)C	10.0	29	80	CFROBOT9.003	2x0.5 (2x0.5)C	blue/black white/brown
CFROBOT9.004	16 G 1.0 + (2 x 1.0)C	16.0	207	324	CFROBOT9.004	16G1.0 (2x1.0)C	Cores white with bla Cores white with bla
CFROBOT9.005	23 G 1.0 + (2 x 1.0)C	19.5	286	462	CFROBOT9.005	23G1.0 (2x1.0)C	Cores white with bla Cores white with bla
CFROBOT9.006	24 G 1.0 + (2 x 1.0)C	20.0	299	476	CFROBOT9.006	24G1.0 (2x1.0)C	Cores white with bla Cores white with bla
CFROBOT9.007	(15x(2x0.25)C+(4x0.25)C)C	18.5	245	384	CFROBOT9.007	15x(2x0.25)C (4x0.25)C	Colour code in acco white/green/brown/
CFROBOT9.010	(4x(2x0.25)C)C	10.5	66	120	CFROBOT9.010	4x(2x0.25)C	white/brown, green

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits. G= with green-yellow earth core x= without earth core

### Order example: CFROBOT9.001 – in your desired length (0.5 m steps) CFROBOT9 chainflex<sup>®</sup> series .001 Code nominal cross section



Online order ► www.chainflex.eu/CFROBOT

Delivery time 24h or today. Delivery time means time until shipping of goods.

EPLAN download, configurators ► www.igus.eu/CFROBOT

1,040 types from stock no cutting costs ...

## ... no minimum order quantity ...

(up to 10 cuts of the same types)

#### 6 extremely heavy duty applications 7 travel distance twisted 3 oil-resistant

white numerals 1-4, one core green-yellow black numerals 5-6 black numerals 4-9 black numerals 1-3

black numerals 1-4, 7-17, one core green-yellow black numerals 5-6 black numerals 1-4, 7-24, one core green-yellow black numerals 5-6 black numerals 1-4, 7-25, one core green-yellow black numerals 5-6 ccordance with DIN 47100 /n/yellow (CAN-Bus) en/yellow, grey/pink, blue/red





#### CF77.UL.D PUR ± 180°

## PUR Control cable, twistable | CF77.UL.D

Ŵ	● PU	twistable applica R outer jacket		
		resistant and coo	olant-resistan	t
		tch-resistant		
		me-retardant	~~	
		C-free/halogen-fr drolysis-/microbe		
	• Hyc		-1031314111	
	Dynan	nic information		
		Bending radius	twisted	minimum 6.8 x d
			flexible	minimum 5 x d
			fixed	minimum 4 x d
	°C	Temperature	twisted	-25 °C to +80 °C
		·	flexible	-40 °C to +80 °C (following EN 60811-504)
119			fixed	-50 °C to +80 °C (following DIN EN 50305)
Part I al	V	v max.	180°/s	
	$\square$	twisted		
	a	a max.	60°/s <sup>2</sup>	
		twisted		
Y Y		Travel distance	Robots and mo	otions in 3D area, Class 7
	±X°	Torsion	$\pm$ 180°, with 1	m cable length
	Cable	structure		
		Conductor	Fine-wire stran	ded conductor consisting of bare copper wires
			(following EN 6	
		Core insulation	Mechanically hi	gh-quality TPE mixture.
þ.——		Core stranding	Number of con	res <12: cores stranded in a layer with short pitch
LAN			Number of cor	$res \ge 12$ : Cores combined in bundles and stranded
			together around	a centre for high tensile stresses with adapted, short
			pitch lengths ar	nd pitch directions, especially low-torsion structure.
MCA)		Core identification		m <sup>2</sup> : Colour code in accordance with DIN 47100
	((?¢		Cores ≥ 0.5 n green-yellow	nm <sup>2</sup> : Cores black with white numerals, one core
			CF77.UL.03.04	4.INI: brown, blue, black, white
1949		Outer jacket	Low-adhesion,	highly abrasion-resistant mixture on the basis of
			PUR, adapted VDE 0282 Part	to suit the requirements in e-chains <sup>®</sup> (following DIN 10).
			Colour: Window	v grey (similar to RAL 7040)
			CF77.UL.03.04	4.INI: Colour: Colza yellow (similar to RAL 1021)
	Electri	ical information		
	Yu	Nominal voltage		res < 12: 300/500 V
AND A LOCAL DESIGNATION OF THE OWNER	$\mathcal{T}_{0}$			res < 12 (0.25-0.34): 300/500 V
				res ≥ 12: 300/500 V (following DIN VDE 0245)
		Testing voltage	2000 V (followir	ng DIN EN 50396)
0				

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## 1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

#### Class 5.7.3 5 heavy duty applications 7 travel distance twisted 3 oil-resistant

### Properties and approvals

UV-resistance	Medium
Oil	Oil-resistant (following DIN EN 50
Offshore	MUD-resistant following NEK 60
Flame-retardant	According to IEC 60332-1-2, CE
Silicon-free	Free from silicon which can affe 3.10.7 – status 1992)
Halogen-free	Following EN 50267-2-1
UL/CSA	< 0.5 mm <sup>2</sup> : Style 10493 and 202 ≥ 0.5 mm <sup>2</sup> : Style 11323 and 212
NFPA	Following NFPA 79-2012 chapte
GL	Certified according to GL Type Te HH
EAC	Certified according to No. TC RL
СТР	Certified according to No. C-DE.
CEI	Following CEI 20-35
Lead free	Following 2011/65/EC (RoHS-II)
Clean room	According to ISO Class 1. Out CF77.UL.05.12.D, tested by IPA
DESINA	According to VDW, DESINA stan
CE	Following 2006/95/EC
	Oil Offshore Flame-retardant Silicon-free Halogen-free UL/CSA UL/CSA IL/CSA GL GL GL CTP CEI Lead free Clean room DESINA

#### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature,	v max. [°/s]	a max. [°/s²]	Torsion max.	Torsion max.	Torsion max.
from/to [°C]	twisted	twisted	[°/m]	[°/m]	[°/m]
-25 / -15			±150	±90	±30
-15 / +70	180	60	±180	±120	±60
+70 / +80			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil
- Indoor and outdoor applications with average sun radiation
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives

## ... no minimum order quantity ...

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Image .



50363-10-2), Class 3

)6 - status 2009

El 20-35, FT1, VW-1

fect paint adhesion (following PV

)233, 300 V, 80 °C 223, 1000 V, 80 °C er 12.9

esting – Certificate No.: 61 935-14

U C-DE.ME77.B.01254

.PB49.B.00416

iter jacket material complies with according to standard 14644-1 ndardisation



### IGUS® CHAINFLEX® CF77.UL.D

Image exemplary

#### Weight Delivery program Number of cores and External diameter Copper index Part No. conductor nominal max. [mm] [kg/km] [kg/km] cross section [mm<sup>2</sup>] CF77.UL.02.04.D 4 x 0.25 35 5.5 11 CF77.UL.03.04.INI 17 40 4 x 0.34 5.5 CF77.UL.05.04.D 4 G 0.5 6.0 22 44 CF77.UL.05.05.D 5 G 0.5 6.5 28 52 CF77.UL.05.07.D 8.0 41 80 7 G 0.5 66 CF77.UL.05.12.D 12 G 0.5 10.0 132 99 184 CF77.UL.05.18.D 18 G 0.5 12.0 CF77.UL.05.25.D 14.0 138 247 25 G 0.5 CF77.UL.05.30.D 15.0 165 325 30 G 0.5 24 55 CF77.UL.07.03.D 3 G 0.75 6.5 32 CF77.UL.07.04.D 7.0 64 4 G 0.75 CF77.UL.07.05.D 5 G 0.75 7.5 40 75 CF77.UL.07.07.D 7 G 0.75 8.5 56 106 CF77.UL.07.12.D 12 G 0.75 12.0 96 192 CF77.UL.07.18.D 18 G 0.75 13.5 143 260 CF77.UL.07.20.D 20 G 0.75 14.5 159 292 CF77.UL.07.25.D 25 G 0.75 16.0 198 368 CF77.UL.07.36.D 36 G 0.75 18.5 297 524 CF77.UL.07.42.D 1.7 42 G 0.75 21.0 365 604 CF77.UL.10.02.D 6.5 22 54 2 x 1.0 CF77.UL.10.03.D 3 G 1.0 6.5 32 65 CF77.UL.10.04.D 4 G 1.0 7.0 43 79 97 CF77.UL.10.05.D 5 G 1.0 8.0 53 CF77.UL.10.07.D 7 G 1.0 9.0 74 119 CF77.UL.10.12.D 12.5 127 234 12 G 1.0 CF77.UL.10.18.D 18 G 1.0 15.0 191 339 452 CF77.UL.10.25.D 25 G 1.0 17.0 264 CF77.UL.10.42.D 708 42 G 1.0 22.5 462

Delivery program Part No.	Number of cores and conductor nominal cross section [mm²]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]
CF77.UL.15.03.D	3 G 1.5	7.5	48	86
CF77.UL.15.04.D	4 G 1.5	8.0	64	105
CF77.UL.15.05.D	5 G 1.5	8.5	80	125
CF77.UL.15.07.D 17)	7 G 1.5	10.5	111	174
CF77.UL.15.12.D	12 G 1.5	14.0	191	308
CF77.UL.15.18.D	18 G 1.5	17.0	286	477
CF77.UL.15.25.D	25 G 1.5	19.5	396	630
CF77.UL.15.36.D 1.7)	36 G 1.5	23.5	594	891
CF77.UL.15.42.D 1.7)	42 G 1.5	26.5	729	1040
CF77.UL.25.03.D	3 G 2.5	8.5	80	124
CF77.UL.25.04.D	4 G 2.5	9.5	106	155
CF77.UL.25.05.D	5 G 2.5	10.5	132	192
CF77.UL.25.07.D <sup>17)</sup>	7 G 2.5	12.5	185	270
CF77.UL.40.04.D 1.7)	4 G 4.0	11.5	185	257

1.7) Delivery time: 7 weeks

<sup>17)</sup> Using the cables with "7 G 1.5 mm<sup>2</sup> and "7 G 2.5 mm<sup>2</sup> it is essential: Bending radius  $\ge$  17 x d with travel distance  $\ge$  5 m. When the travel distance is not less than 5 m, a bending radius not lass than 17 x d has to be used Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits. G= with green-yellow earth core x= without earth core



Delivery time means time until shipping of goods.

Delivery time 24h or today.

1.7) Delivery time: 7 weeks

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits

G= with green-yellow earth core x= without earth core



1,040 types from stock no cutting costs ...

### (up to 10 cuts of the same types)

## ... no minimum order quantity ...

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#### CFROBOT2 PUR ± 180°

## PUR Control cable, twistable | CFROBOT2

twisted

flexible

twisted flexible

fixed

fixed 180°/s

60°/s2

minimum 10 x d

minimum 8 x d

minimum 5 x d

Robots and motions in 3D area, Class 7

Mechanically high-quality TPE mixture.

(following DIN VDE 0282, Part 10).

300/500 V (following DIN VDE 0245)

2000 V (following DIN EN 50396)

Colour: Steel blue (similar to RAL 5011)

 $\pm$  180°, with 1 m cable length

approx. 85 % optical.

High

-25 °C to +80 °C

-40 °C to +80 °C (following EN 60811-504)

-50 °C to +80 °C (following DIN EN 50305)

Stranded conductor in especially bending-resistant version

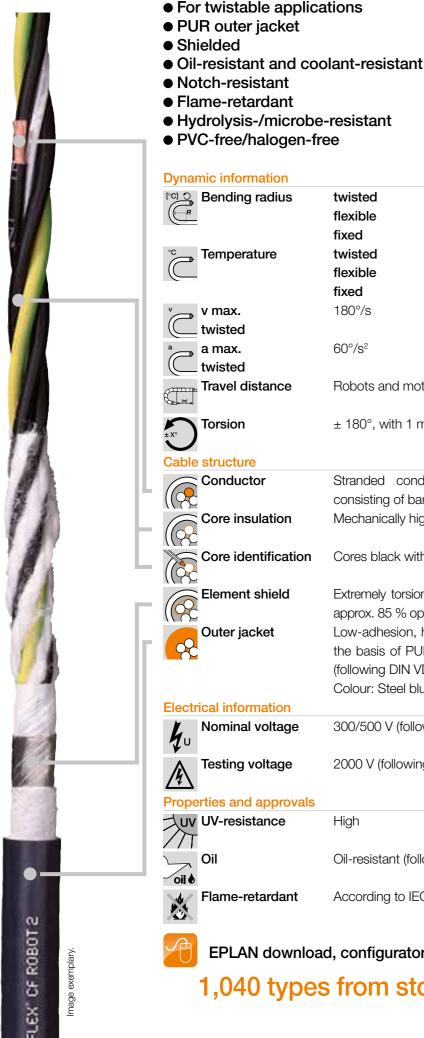
Extremely torsion-resistant tinned braided copper shield. Coverage

Low-adhesion, halogen-free, highly abrasion-resistant mixture on

the basis of PUR, adapted to suit the requirements in e-chains®

consisting of bare copper wires (following EN 60228).

Cores black with white numerals, one core green-yellow



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1,040 types from stock no cutting costs ...

Oil-resistant (following DIN EN 50363-10-2), Class 3

According to IEC 60332-1-2, CEI 20-35, FT1, VW-1

(up to 10 cuts of the same types)

## Class 6.7.3

X	Silicon-free Halogen-free	Free from silicon which can affe 3.10.7 – status 1992) Following EN 50267-2-1
Hal	UL/CSA	Style 10493 and 20317, 300 V, 8
NFPA	NFPA	Following NFPA 79-2012 chapter
FAI	EAC	Certified according to No. TC RU
G	СТР	Certified according to No. C-DE.F
Ē	CEI	Following CEI 20-35
RoHS-	Lead free	Following 2011/65/EC (RoHS-II)
Clean Room	Clean room	According to ISO Class 1. Oute CF27.07.05.02.01.D, tested by IPA
(F	CE	Following 2006/95/EC

#### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature, from/to [°C]	v max. [°/s] twisted	a max. [°/s²] twisted	Torsion max. [°/m]	Torsion max. [°/m]	Torsion max. [°/m]
-25 / -15			±150	±90	±30
-15 / +70	180	60	±180	±120	±60
+70 / +80			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

**CE** CE

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives

Delivery program Part No.	Number of cores and conductor nominal cross section [mm <sup>2</sup> ]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]
CFROBOT2.07.04.C	(4 G 0.75)C	8.5	45	84
CFROBOT2.07.05.C	(5 G 0.75)C	8.5	54	94
CFROBOT2.07.07.C	(7 G 0.75)C	10.0	75	130
CFROBOT2.07.12.C 1.10)	(12 G 0.75)C	14.0	131	219
CFROBOT2.07.18.C	(18 G 0.75)C	16.5	197	321
110 Deliver times 10 weeks				

1.10) Delivery time: 10 weeks

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits G= with green-yellow earth core x= without earth core

## ... no minimum order quantity ...

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#### 6 extremely heavy duty applications 7 travel distance twisted 3 oil-resistant

ect paint adhesion (following PV

80 °C

er 12.9

C-DE.ME77.B.01254

PB49.B.00416

ter jacket material complies with A according to standard 14644-1.



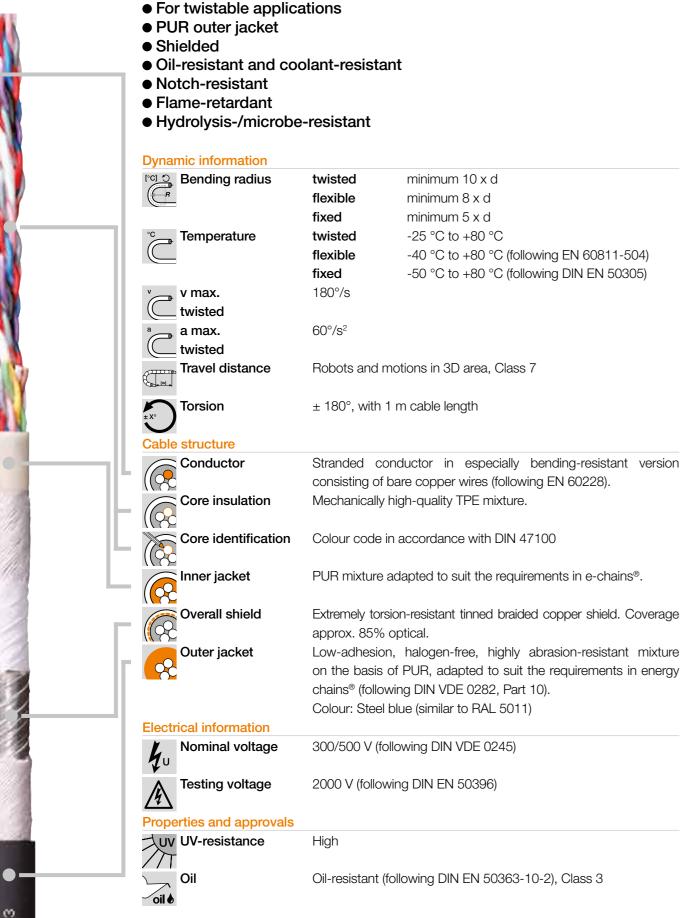
**cN**us





#### CFROBOT3 PUR ± 180°

## PUR Data cable, twistable | CFROBOT3



Uld	155 0.7.3	6 extremely heavy duty applications 7
A ST	Flame-retardant	According to IEC 60332-1-2, CEI 2
	Silicon-free	Free from silicon which can affec 3.10.7 – status 1992)
c <b>FL</b> us	UL/CSA	Style 10497 and 20911, 300 V, 80
NFPA	NFPA	Following NFPA 79-2012 chapter 1
EAC	EAC	Certified according to No. TC RU C
C	СТР	Certified according to No. C-DE.PE
Ē	CEI	Following CEI 20-35
RoHS-	Lead free	Following 2011/65/EC (RoHS-II)
Clean- Room	Clean room	According to ISO Class 1. Outer CF27.07.05.02.01.D, tested by IPA
CE	CE	Following 2006/95/EC

### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Cycles					TOTHINOT
Temperature,	v max. [°/s]	a max. [°/s²]	Torsion max.	Torsion max.	Torsion max.
from/to [°C]	twisted	twisted	[°/m]	[°/m]	[°/m]
-25 / -15			±150	±90	±30
-15 / +70	180	60	±180	±120	±60
+70 / +80			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives

	Delivery program Part No.	Number of cores and conductor nominal cross section [mm <sup>2</sup> ]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]
New	CFROBOT3.02.04.02	(4x(2x0.25))C	11.0	50	149
	CFROBOT3.02.06.02	(6x(2x0.25))C	12.0	64	171
New	CFROBOT3.02.08.02	(8x(2x0.25))C	13.5	81	228
	CFROBOT3.05.05.02	(5x(2x0.5))C	13.0	90	223

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits G= with green-yellow earth core x= without earth core

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1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

## ... no minimum order quantity ...

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## Class 6.7.3 6 extremely heavy duty applications 7 travel distance twisted 3 oil-resistant

20-35, FT1, VW-1

ct paint adhesion (following PV

O°C

12.9

C-DE.ME77.B.01254

PB49.B.00416

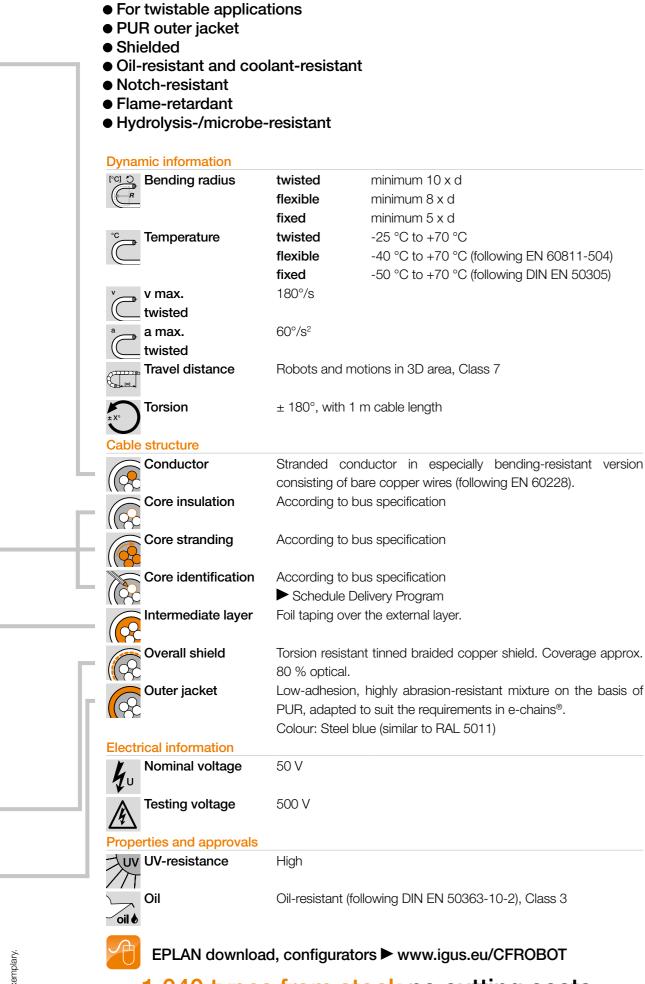
r jacket material complies with according to standard 14644-1.





#### CFROBOT8 PUR ± 180°

## PUR Bus cable, twistable | CFROBOT8



1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

### Class 6.7.3

Flame-reta	ardant A	According to IEC 60332-1-2, CEI 20-35, FT1						
Silicon-free		ree from silico .10.7 – status		fect paint adhesi	ion (following PV			
UL/CSA		≤ 0.25 mm <sup>2</sup> : Style 1589 and 20236, 30 V, 80 °C						
c <b>FL</b> us	>	0.25 mm <sup>2</sup> :	Style 1589 and	1 20963, 30 V, 80	0°C			
EHE EAC	C	Certified according to No. TC RU C-DE.ME77.B.01218						
CTP	C	Certified accore	ding to No. C-DE	.PB49.B.00416				
CEI	F	ollowing CEI 2	20-35					
RoHS I Lead free	F	Following 2011/65/EC (RoHS-II)						
Clean room	n A	According to ISO Class 1. Outer jacket material complies with						
Room	C	F27.07.05.02	.01.D, tested by II	PA according to st	tandard 14644-1.			
CCC	F	ollowing 2006	/95/EC					
CE								
Guaranteed lifeting	me according	g to guarante	e conditions (Pa	age 22-25)				
Cycles *			5 million	7.5 million	10 million			
Temperature,	v max. [°/s]	a max. [°/s²]	Torsion max.	Torsion max.	Torsion max.			
from/to [°C]	twisted	twisted	[°/m]	[°/m]	[°/m]			
-25 / -15			±150	±90	±30			
-15 / +60	180	60	±180	±120	±60			
+60 / +70			±150	±90	±30			
* Higher number of	cycles possible	e - please ask fo	or your individual ca	alculation.				
Typical application								
• For extremely he	5 5 1 1			nts				
<ul> <li>Almost unlimited</li> </ul>								
Indoor and outd								
<ul> <li>Especially for ro</li> </ul>			3D range					
Robots handlin	a enindla driv							

Robots, handling, spindle drives

Delivery program Part No.	Number of cores and conductor nominal cross section [mm²]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]	
CFROBOT8.001 (Profibus)	(2x0.35)C	8.0	29	62	
CFROBOT8.022 (Can-Bus)	(4x0.5)C	7.0	43	72	
CFROBOT8.045 (GigE)	4x(2x0.14)C	8.5	39	69	
CFROBOT8.060 (Profinet)	(2x(2x0.34))C	8.5	36	70	

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits G= with green-yellow earth core x= without earth core

Part No.	Characteristic wave impedance approx. [Ω]	Core group	Co
CFROBOT8.001	150	(2x0.35)C	re
CFROBOT8.022	120	(4x0.5)C	w
CFROBOT8.045	100	(4x(2x0.14)C)	wł wł
CFROBOT8.060	100	(2x(2x0.34))C	w

## ... no minimum order quantity ...

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•-

#### 6 extremely heavy duty applications 7 travel distance twisted 3 oil-resistant

olour code

#### ed, green

hite, green, brown, yellow (star-quad stranding) hite-green/green, white-orange/orange, white-blue/blue, /hite-brown/brown

/hite/blue, yellow/orange









F

RoHS-II

Clean Room

#### CFROBOT4 PUR ± 180°

## PUR Measuring system cable, twistable | CFROBOT4

Class 6.7.3

<ul> <li>Oil-resista</li> <li>Notch-res</li> <li>Flame-ret</li> <li>Hydrolysis</li> </ul>	istant ardant s-/microbe	-resistant	ant
PVC-free/	Ū	ee	
<b>Dynamic infor</b>		twisted	minimum 10 x d
		flexible	minimum 8 x d
		fixed	minimum 5 x d
	ature	twisted	-25 °C to +80 °C
$(\square$		flexible	-40 °C to +80 °C (following EN 60811-504)
		fixed	-50 °C to +80 °C (following DIN EN 50305)
v max.		180°/s	
(C twisted			
a max.		60°/s <sup>2</sup>	
(C twisted			
Travel d	istance	Robots and	motions in 3D area, Class 7
Torsion		± 180°, with	1 m cable length
Cable structur	e		
Conduc	tor		conductor in especially bending-resistant version f bare copper wires (following EN 60228).
Core ins	sulation	•	y high-quality TPE mixture.
	entification	A a a ardina ta	- many using a votam ana sification
Core lue	Infincation		o measuring system specification Delivery Program
Elemen	shiold		rsion-resistant tinned braided copper shield. Covera
	Silleiu	approx. 85 %	
Overall	shield		stant tinned braided copper shield. Coverage appro
	Silicia	80 % optica	
Outer ja	cket	-	n, halogen-free, highly abrasion-resistant mixture on the ba
			ted to suit the requirements in energy chains <sup>®</sup> (following D
		-	art 10). Colour: Steel blue (similar to RAL 5011)
Electrical info	mation		
<b>h</b> U Nomina	l voltage	50 V	
A Testing	voltage	500 V	
$\overline{4}$			

Properties and approvals	
UV UV-resistance	High
Oil	Oil-resistant (following DIN EN 50
Flame-retardant	According to IEC 60332-1-2, CE
Silicon-free	Free from silicon which can affe 3.10.7 – status 1992)
Halogen-free	Following EN 50267-2-1
	Style 1589 and 20236, 30 V, 80
	Following NFPA 79-2012 chapte
EAC EAC	Certified according to No. TC RU
CTP CTP	Certified according to No. C-DE.
CEI	Following CEI 20-35
RoHS-	Following 2011/65/EC (RoHS-II)
Clean room	According to ISO Class 1. Out CF27.07.05.02.01.D, tested by IF
CE	Following 2006/95/EC

#### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature,	v max. [°/s]	a max. [°/s²]	Torsion max.	Torsion max.	Torsion max.
from/to [°C]	twisted	twisted	[°/m]	[°/m]	[°/m]
-25 / -15			±150	±90	±30
-15 / +70	180	60	±180	±120	±60
+70 / +80			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives

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1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

## ... no minimum order quantity ...



50363-10-2), Class 3

El 20-35, FT1, VW-1

ffect paint adhesion (following PV

°C

ter 12.9

RU C-DE.ME77.B.01218

E.PB49.B.00416

uter jacket material complies with IPA according to standard 14644-1.



### CHAINFLEX® CF ROBOT 4

Image exemplary.							
Delivery program Part No.	Number of cores and conductor nominal cross section [mm <sup>2</sup> ]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]	Part No.	Core group	Colour code
CFROBOT4.001	(3x(2x0.14)C+(4x0.14)+(2x0.5))C	10.5	65	119	CFROBOT4.001	3x(2x0.14)C 4x0.14 2x0.5	green/yellow, black/ grey/blue/white-yello brown-red/brown-bl
CFROBOT4.002 1.10)	(3x(2x0.14)C+2x(0.5)C)C	10.5	70	122	CFROBOT4.002 1.10)	3x(2x0.14)C 2x(0.5)C	green/yellow, black/ black, red
CFROBOT4.006	(3x(2x0.14)C+(4x0.14)+ (4x0.22)+(2x0.5))C	11.5	78	143	CFROBOT4.006	3x(2x0.14)C (4x0.14) (4x0.22) (2x0.5)	green/yellow, brown grey/blue/white-yello brown-yellow/brown brown-red/brown-bl
CFROBOT4.009	(4x(2x0.25)+(2x0.5))C	9.5	51	93	CFROBOT4.009	4x(2x0.25) 2x0.5	brown/green, blue/v white, brown
CFROBOT4.015	(4x(2x0.14)+4x0.5)C	9.0	52	96	CFROBOT4.015	4x(2x0.14) 4x0.5	brown/green, violet/ blue, white, brown-g
CFROBOT4.028 <sup>16)</sup>	(2x(2x0.20)+(2x0.38))C	7.5	47	75	CFROBOT4.028 <sup>16)</sup>	2x(2x0.20) (2x0.38)	green/yellow, pink/b red/black

1.10) Delivery time: 10 weeks

<sup>16)</sup> Colour outer jacket: Yellow-green (similar RAL 601<sup>8)</sup>

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits. G= with green-yellow earth core x= without earth core

### Order example: CFROBOT4.009 – in your desired length (0.5 m steps) CFROBOT4 chainflex® series .009 Code measuring system type



Online order ► www.chainflex.eu/CFROBOT



Delivery time 24h or today. Delivery time means time until shipping of goods.

EPLAN download, configurators ► www.igus.eu/CFROBOT

1,040 types from stock no cutting costs ...

## ... no minimum order quantity ...

(up to 10 cuts of the same types)

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#### 6 extremely heavy duty applications 7 travel distance twisted 3 oil-resistant





k/brown, red/orange ellow/white-black -blue k/brown, red/orange

vn/black, red/orange ellow/white-black wn-grey/green-black/green-red

-blue

e/violet, grey/pink, red/black

et/yellow, grey/pink, red/black n-green, white-green /blue



## CFROBOT5 TPE Fibre optic cable, twistable | CFROBOT5

• For twistable applications

• TPE outer jacket

• Oil-resistant

TPE

<ul> <li>Bio-oil-resistant</li> <li>UV-resistant</li> </ul>					
<ul> <li>Low-temperature-fle</li> <li>Hydrolysis-/microbe</li> <li>PVC-free/halogen</li></ul>	-resistant				
Dynamic information					
Bending radius	twisted flexible fixed	minimum 10 x d minimum 8 x d minimum 5 x d			
	twisted flexible fixed	-35 °C to +80 °C -50 °C to +80 °C (following EN 60811-504) -55 °C to +80 °C (following DIN EN 50305)			
v max. twisted	180°/s				
a max. twisted Travel distance		60°/s² Robots and motions in 3D area, Class 7			
Torsion	± 180°, with 1 m cable length				
Cable structure           Fibre optic cables	50/125 µm, 62 strain relief.	.5/125 µm special fixed wire elements with aramide			
Core stranding	FOC wires stra GRP central ele	nded with high-tensile aramide dampers around the ement.			
Core identification	Schedule D	elivery Program			
Outer jacket	Low-adhesion mixture on the basis of TPE, especially abrasion- resistant and highly flexible, adapted to suit the requirements in e-chains <sup>®</sup> . Colour: Jet black (similar to RAL 9005)				
Properties and approvals	High				
Oil		following DIN EN 60811-2-1), bio-oil-resistan IA 24568 with Plantocut 8 S-MB tested by DEA)			
Silicon-free Halogen-free	Free from silicon which can affect paint adhesion (following P\ 3.10.7 – status 1992) Following EN 50267-2-1				
Hal					

Class 6.7.4



According to ISO Class 1. Outer jacket material complies with CF9.15.07, tested by IPA according to standard 14644-1

Following 2006/95/EC

Following 2011/65/EC (RoHS-II)

#### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature, from/to [°C]	v max. [°/s] twisted	a max. [°/s²] twisted	Torsion max. [°/m]	Torsion max. [°/m]	Torsion max. [°/m]
-35 / -25			±150	±90	±30
-25 / +70	180	60	±180	±120	±60
+70/+80			±150	±90	±30
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\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil, also with bio-oils
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling

Delivery program Part No.	Number of fibres	Fibre diameter approx. [µm]	External diameter max. [mm]	Weight [kg/km]	
CFROBOT5.500	2	62.5/125	8.5	87	
CFROBOT5.501	2	50/125	8.5	87	
Noto: The mentioned external diameters	are maximum values and ma	w tond toward lower tel	vranco limite		

The mentioned external diameters are maximum values and may tend toward lower tolerance limits

Part No.	Bandwidth with 850 nm [MHz x km]		Bandwidth with 1300 nm [MHz x km]		Colour code
CFROBOT5.500	≥ 200	≤ 3.0	≥ 500	≤ 0.7	orange with white numerals
CFROBOT5.501	≥ 500	≤ 2.5	≥ 500	≤ 0.7	blue with white numerals

	Order example: CFROBOT5.501 – in your of CFROBOT5 chainflex® series .501 Code Type of
€	Online order ► www.chainflex.eu/CFROBOT

Delivery time 24h or today.

Delivery time means time until shipping of goods.

EPLAN download, configurators ► www.igus.eu/CFROBOT

1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

## ... no minimum order quantity ...

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CFROBOT5 TPE ± 180°

### desired length (0.5 m steps) of fibres



#### CFROBOT6 PUR ± 180°

## PUR Power cable, twistable | CFROBOT6

• For twistable applications

Oil-resistant and coolant-resistant

• PUR outer jacket

Unshielded



<ul> <li>Oli-resistant and col</li> <li>Notch-resistant</li> <li>Eleme reterdent</li> </ul>	olant-resist	ant
<ul> <li>Flame-retardant</li> <li>Hydrolysis-/microbe</li> </ul>	e-resistant	
PVC-free/halogen-fi		
Dynamic information		
Bending radius	twisted	minimum 10 x d
	flexible	minimum 8 x d
-	fixed	minimum 5 x d
<sup>°C</sup> Temperature	twisted	-25 °C to +80 °C
	flexible	-40 °C to +80 °C (following EN 60811-504)
	fixed	-50 °C to +80 °C (following DIN EN 50305)
v max.	180°/s	
	000/-2	
a max.	60°/s²	
	Debate and	motions in 2D area. Class 7
Travel distance	RODOLS and	motions in 3D area, Class 7
Torsion	± 180°, with	1 m cable length
Cable structure		
Conductor	Stranded c	conductor in especially bending-resistant versior
	consisting o	f bare copper wires (following EN 60228).
Core insulation	Mechanically	y high-quality TPE mixture.
Core identification	Power cores	s: Cores black with white numerals, one core green
		chedule delivery program
Outer jacket	-	on, highly abrasion-resistant mixture on the basis o
22		ed to suit the requirements in e-chains <sup>®</sup> (following DIN
	•	Part 10). Colour: Steel blue (similar to RAL 5011)
Electrical information	,	
ku Nominal voltage	600/1000 V	(following DIN VDE 0250)
Testing voltage	4000 V (follo	owing DIN EN 50396)
Properties and approvals		
JUV UV-resistance	High	
/TT	5	
Oil	Oil-resistant	(following DIN EN 50363-10-2), Class 3
Flame-retardant	According to	DIEC 60332-1-2, CEI 20-35, FT1, VW-1
Silicon-free	Free from s 3.10.7 – sta	ilicon which can affect paint adhesion (following P\ tus 1992)

EPLAN download, configurators ► www.igus.eu/CFROBOT

1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

## Class 6.7.3

Hal

NFPA NFPA

EHE EAC

CEI

**CE** CE

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ROHS- Lead free

Halogen-free	Following EN 50267-2-1
UL/CSA	Style 10492 and 21223, 1000 V,
NFPA	Following NFPA 79-2012 chapter
EAC	Certified according to No. TC RU
СТР	Certified according to No. C-DE.
CEI	Following CEI 20-35
Lead free	Following 2011/65/EC (RoHS-II)
Clean room	According to ISO Class 1. Oute CF27.07.05.02.01.D, tested by IP
CE	Following 2006/95/EC

#### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature,	v max. [°/s]	a max. [°/s²]	Torsion max.	Torsion max.	Torsion max.
from/to [°C]	twisted	twisted	[°/m]	[°/m]	[°/m]
-25 / -15			±150	±90	±30
-15 / +70	180	60	±180	±120	±60
+70 / +80			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives

Delivery program Part No.	Number of cores and conductor nominal cross section [mm <sup>2</sup> ]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]	
CFROBOT6.100.03	3G10	16.0	317	414	
CFROBOT6.160.03	3G16	18.5	508	618	כחנ
CFROBOT6.250.03	3G25	23.0	795	962	
CFROBOT6.350.03	3G35	25.5	1122	1298	

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits G= with green-yellow earth core x= without earth core



Delivery time 24h or today.

Delivery time means time until shipping of goods.

## ... no minimum order quantity ...

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#### 6 extremely heavy duty applications 7 travel distance twisted 3 oil-resistant



80 °C

er 12.9

J C-DE.ME77.B.01255

.PB49.B.00420

ter jacket material complies with PA according to standard 14644-1.





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**CRU**US

NFPA

## PUR Power cable, twistable | CFROBOT7

CFROBOT7



## • For twistable applications

- PUR outer jacket
- Shielded
- Oil-resistant and coolant-resistant
- Notch-resistant
- Flame-retardant
- Hydrolysis-/microbe-resistant
- PVC-free/halogen-free

### **Dynamic information**

Dynamic information		
Bending radius	twisted	minimum 10 x d
	flexible	minimum 8 x d
	fixed	minimum 5 x d
°c Temperature	twisted	-25 °C to +80 °C
	flexible	-40 °C to +80 °C (following EN 60811-504)
	fixed	-50 °C to +80 °C (following DIN EN 50305)
v max.	180°/s	
(C twisted		
a max.	60°/s²	
(C twisted		
Travel distance	Robots and me	otions in 3D area, Class 7
Torsion	± 180°, with 1	m cable length
±x° →		
Cable structure		
Conductor	Stranded cor	nductor in especially bending-resistant version
	consisting of b	are copper wires (following EN 60228).
Core insulation	Mechanically h	igh-quality TPE mixture.
Core identification	Power cores:	Cores black with white numerals, one core green-
	yellow. 🕨 Sche	edule delivery program
	2 Control pair	s: Core black with white numerals.
	1. Control core	e: 5 2. Control core: 6
	3. Control core	e: 7 4. Control core: 8
	4 Control pair	s: Colour code in accordance with DIN 47100
Overall shield	Extremely torsid	on-resistant tinned braided copper shield. Coverage
	approx. 85% c	ptical.
Outer jacket	Low-adhesion,	, halogen-free, highly abrasion-resistant mixture

Low-adhesion, halogen-free, highly abrasion-resistant mixture on the basis of PUR, adapted to suit the requirements in energy chains® (following DIN VDE 0282, Part 10).

### **Electrical information**

600/1000 V (following DIN VDE 0250) Nominal voltage

Testing voltage 4000 V (following DIN EN 50396)

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EPLAN download, configurators ► www.igus.eu/CFROBOT

## 1,040 types from stock no cutting costs ...

Colour: Steel blue (similar to RAL 5011)

(up to 10 cuts of the same types)

## Class 6.7.3

### Properties and approvals

Properties and approvais	
UV UV-resistance	High
Oil o	Oil-resistant (following DIN EN 50
Flame-retardant	According to IEC 60332-1-2, CE
Silicon-free	Free from silicon which can affe 3.10.7 – status 1992)
Halogen-free	Following EN 50267-2-1
	Style 10492 and 21223, 1000 V,
	Following NFPA 79-2012 chapter
ERE EAC	Certified according to No. TC RU
CTP	Certified according to No. C-DE.F
CEI	Following CEI 20-35
RoHsa Lead free	Following 2011/65/EC (RoHS-II)
Clean room	According to ISO Class 1. Oute CF27.07.05.02.01.D, tested by IP
CE	Following 2006/95/EC

### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature,	v max. [°/s]	a max. [°/s²]	Torsion max.	Torsion max.	Torsion max.
from/to [°C]	twisted	twisted	[°/m]	[°/m]	[°/m]
-25 / -15			±150	±90	±30
-15 / +70	180	60	±180	±120	±60
+70 / +80			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives

... no minimum order quantity ...

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#### 6 extremely heavy duty applications 7 travel distance twisted 3 oil-resistant



0363-10-2), Class 3

EI 20-35. FT1. VW-1

fect paint adhesion (following PV

80 °C

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.PB49.B.00420

iter jacket material complies with PA according to standard 14644-1



## PUR Power cable, twistable | CFROBOT7

## GUS<sup>®</sup> CHAINFLEX<sup>®</sup> CF ROBOT 7

Image exemplary.

Delivery program Part No. Without control pair	Number of cores and conductor nominal cross section [mm <sup>2</sup> ]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]	
CFROBOT7.15.03.C	(3G1.5)C	8.5	64	103	
CFROBOT7.15.04.C	(4G1.5)C	9.5	82	127	
CFROBOT7.25.03.C	(3G2.5)C	10.0	98	147	
CFROBOT7.25.04.C	(4G2.5)C	10.5	127	182	
CFROBOT7.60.04.C	(4G6.0)C	15.0	296	403	
2 Control pairs					
CFROBOT7.15.15.02.02.C	(4G1.5+2x(2x1.5)C)C	16.5	211	325	
CFROBOT7.25.15.02.02.C	(4G2.5+2x(2x1.5)C)C	17.0	259	381	
4 Control pairs					
CFROBOT7.40.02.02.04.C	(4G4+4x(2x0.25)C)C	17.0	270	384	



Online order ► www.chainflex.eu/CFROBOT

Delivery time 24h or today. Delivery time means time until shipping of goods.

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits. G= with green-yellow earth core x= without earth core

1,040 types from stock no cutting costs ...

## ... no minimum order quantity ...

(up to 10 cuts of the same types)







#### CFROBOT TPE ± 180°

## TPE Motor cable, twistable | CFROBOT



•	For	twista	ble	app	licat	ions
---	-----	--------	-----	-----	-------	------

- TPE outer jacket
- Shielded
- Oil-resistant, bio-oil-resistant
- PVC-free
- UV-resistant
- Flame-retardant
- Hydrolysis-/microbe-resistant

### Dynamic information

	minimum 10 x d		
	minimum 8 x d		
	minimum 5 x d		
	-35 °C to +90 °C		
flexible	-45 °C to +100 °C (following EN 60811-504)		
fixed	-50 °C to +100 °C (following DIN EN 50305)		
180°/s			
60°/s²			
Robots and motions in 3D area, Class 7			
$\pm$ 180°, with 1	± 180°, with 1 m cable length		
Extremely bar	nd-resistant cable		
Extremely bend-resistant cable			
Machanically high quality TPE mixture			
Mechanically high-quality TPE mixture.			
Overall shield Extremely torsion-resistant tinned braided copper shield. Coverage approx. 90 % optical.			
resistant and highly flexible, adapted to suit the requirements			
e-chains <sup>®</sup> . Co	olour: Jet black (similar to RAL 9005)		
600/1000 V (f	following DIN VDE 0250)		
4000 V (follow	ving DIN EN 50396)		
High			
Oil-resistant	(following DIN EN 60811-2-1), bio-oil-resista		
(following VDI	MA 24568 with Plantocut 8 S-MB tested by DE		
Class 4			
According to	IEC 60332-1-2, CEI 20-35, FT1, VW-1		
<u> </u>			
Free from sili	con which can affect paint adhesion (following		
3.10.7 – statu	is 1992)		
	180°/s 60°/s <sup>2</sup> Robots and n ± 180°, with <sup>-</sup> Extremely ber Mechanically Extremely tors approx. 90 % Low-adhesior resistant and e-chains®. Co 600/1000 V (f 4000 V (follow High Oil-resistant (following VDI Class 4		

## 1,040 types from stock no cutting costs ...

(up to 10 cuts of the same types)

## Class 6.7.4

Style 10258 and 21387, 1000 V,
Following NFPA 79-2012 chapter
Certified according to No. TC RU
Certified according to No. C-DE.F
Following CEI 20-35
Following 2011/65/EC (RoHS-II)
According to ISO Class 1. Oute CF34.UL.25.04.D, tested by IPA a
Following 2006/95/EC

#### Guaranteed lifetime according to guarantee conditions (Page 22-25)

Cycles *			5 million	7.5 million	10 million
Temperature,	v max. [°/s]	a max. [°/s²]	Torsion max.	Torsion max.	Torsion max.
from/to [°C]	twisted	twisted	[°/m]	[°/m]	[°/m]
-35 / -25			±150	±90	±30
-15 / +80	180	60	±180	±120	±60
+80 / +90			±150	±90	±30

\* Higher number of cycles possible - please ask for your individual calculation.

#### Typical application areas

- For extremely heavy duty applications with torsion movements
- Almost unlimited resistance to oil, also with bio-oils
- Indoor and outdoor applications, UV-resistant
- Especially for robots and movements in the 3D range
- Robots, handling, spindle drives

					NFP
Delivery program Part No.	Number of cores and conductor nominal cross section [mm <sup>2</sup> ]	External diameter max. [mm]	Copper index [kg/km]	Weight [kg/km]	
CFROBOT.035	(1x10.0)C	10.5	134	209	MARITIM
CFROBOT.036	(1x16.0)C	12.0	202	293	EA
CFROBOT.037	(1x25.0)C	14.5	318	454	[1
CFROBOT.038	(1x35.0)C	15.5	431	574	
CFROBOT.039	(1x50.0)C	18.0	601	781	

Note: The mentioned external diameters are maximum values and may tend toward lower tolerance limits G= with green-yellow earth core x= without earth core



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Image

#### 6 extremely heavy duty applications 7 travel distance twisted 4 oil-resistant

90 °C

er 12.9

U C-DE.ME77.B.01255

.PB49.B.00420

ter jacket material complies with according to standard 14644-1



**cR**Us



