KABELSCHLEPP

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3D-LINE

Cable carriers for 3D movements

ROBOTRAX

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Cable carriers for 3D movements

ROBOTRAX

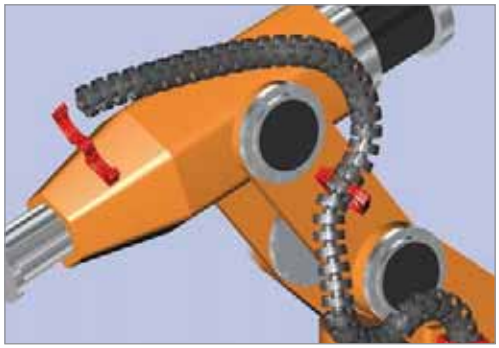
product design award 2006

ROBOTRAX – Cable carrier for 3D movements

- For three-dimensional movements
- Open design
  - – Fast cable laying by simple pressing in of the cables – no threading through is necessary
  - – Simple inspection of all the cables
- Can be deployed on robots for swiveling and rotational movements
- The same system for robot feet and arms
- Optimum system for long service life of the cables:
  - – The minimum bend radius can be maintained
  - – The cables are cleanly isolated in three separate chambers
- Special plastic for long service life

Less expense – lower costs owing to simple cable laying

Even pre-assembled cables can simpy be pressed in, and a lightning-quick exchange of the cable is possible, giving you the added advantage of lower costs..



Simple fastening

Fast-clamping holders are available for individual fastening.

Protection from flying sparks and dirt

For different environmental conditions, protective covers or heat shields made of different materials can be supplied.

ROBOTRAX – Cable carrier for 3D movements

Design principle

Chain links

The basic structure of ROBOTRAX consists of plastic links.
These have ball and socket style snap-together connectors on both sides.
The individual links can thus be snapped together to form a cable carrier.

Internal bend radius stoppers ensure that the minimum
bend radius is maintained in all directions.

Radial link rotation movement is also possible (see table).

Steel wire and shim bolts

When the robot arms are moving quickly, high accelerations
occur, exerting high pulling forces on the cable carrier.

To be able to transmit these pulling forces ROBOTRAX has a hole in the middle of every chain link, through which a steel wire is drawn. This steel wire adopts the role of force transmission. The steel wire has a shim bolt attached to each end. As a result ROBOTRAX can achieve accelerations up to 10 g and higher.

Long service life of the cables and hoses:
The forces are transmitted by the cable carrier and not
by the cables and hoses.

Quick-opening mounting brackets

The fixing and further guidance of the ROBOTRAX (on the arms of the robot)
is achieved by means of quick-opening mounting brackets, fastened with two screws.

The quick-opening mounting brackets fit any chain link. The fastening points can
therefore be individually matched to the movement sequence of the robot.

Quickly opened:
Simply unlock the lynch pin, pull it out and open the quick-opening mounting bracket.

ROBOTRAX Accessories

A suitable accessory for every application

Impact protection

When a robot is moving, a striking of the ROBOTRAX against machine components often cannot be avoided.

An impact protective device made of elastomer plastic can easily be attached to each link using a cable tie.

Heat shield/Protective sleeve

Heat shield: The heat shield, made of aluminium-coated textile fiber, protects the cable carrier and the cables within from flying sparks.
A heat shield is recommended where there are flying sparks.

Protective sleeve: The protective sleeve made of layered polyester offers protection against aggressive cutting and hydraulic oils as well as from fine dusts and paint sprays (not illustrated).

Chucking device

This can be used to set the steel wire to the desired tension quickly and easily, and can be readjusted at any time.

Strain relief

For securing the cables and hoses.

(A strain relief device cannot be used on the same end of the ROBOTRAX as a chucking device.)

ROBOTRAX Accessories

A suitable accessory for every application.

Bend radius determiner

This is used to achieve larger bend radii than the standard bend radius, e.g. in order to maintain the minimum bend radius of the cables.

Quick-opening bracket mounted on a rotary plate

Yet one more degree of freedom on the fastening points.

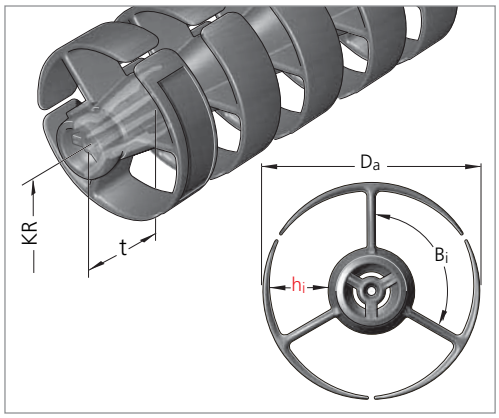
The quick-opening mounting bracket can also rotate on a rotary plate, thus providing greater flexibility when the robot is performing complex movements.

Quick-opening bracket on a helical spring

If the bracket is mounted on a helical spring, it can give elastically in all directions, swivel, swing out in 3 dimensions and spring back ito place again.

ROBOTRAX – Cable carrier for 3D movements

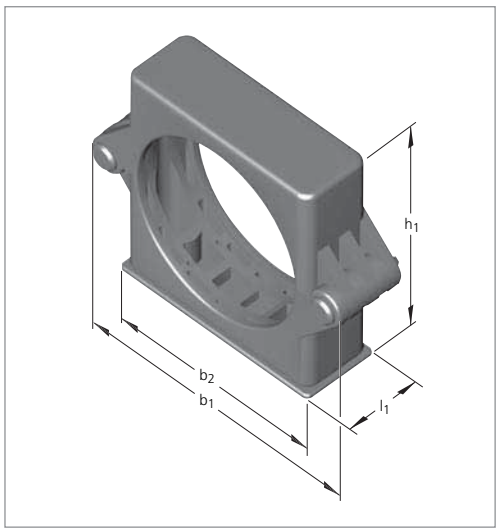
Dimensions



Dimensions of ROBOTRAX cable carrier

Dimensions in mm

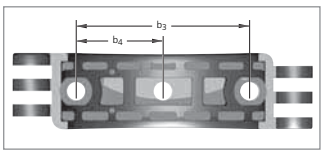
Type	R 040	R 056	R 075	R 085	R 100
For cable-Ø	2 – 8.5	2 – 11	3 – 18	3 – 20	3 – 27
Bend radius	80	115	145	175	195
Radial link rotation over 1 m length	± 450°	± 300°	± 215°	± 215°	± 215°
D_a	40	56	75	85	100
B_i	27	39	52	54	64
h_i	10	14	22	24	31
t	21.5	32	40	40	40



Dimensions of ROBOTRAX quick-opening bracket

Dimensions in mm

Type	R 040	R 056	R 075	R 085	R 100
h_1	54	70	86	105	120
l_1	15	22	28	30	32
b_1	82	86	110	133	150
b_2	50	63	82	96	112
b_3	36	48	64	72	70
b_4	18	24	32	36	35



Screwing of the quick-opening bracket:

R 040, R 056 with **M4** hexagonal screws
R 075 with **M6** hexagonal screws
R 085, R 100 with **M8** hexagonal screws

ROBOTRAX – Cable carrier for 3D movements

Part numbers for ordering

Mounted chain links

Type	R 040	R 056	R 075	R 085	R 100
Bend radius	80	115	145	175	195
Number of links	47	31	25	25	25
Part no.	60301	60401	60501	60601	60701

Quick-opening bracket for ROBOTRAX

Type	R 040	R 056	R 075	R 085	R 100
Part no.	260410	260510	260110	260210	260310

Shim bolts – 2 pieces (one pair)

Type	R 040	R 056	R 075	R 085	R 100
Part no.	260420	260520	260220	260220	260320

Steel wire – Please specify total length or partial lengths.

Dimensions in mm

Type	R 040	R 056	R 075	R 085	R 100
Ø	1,8	2,5	3,0	3,0	4,0
Part no.	60583	60584	60580	60580	60581

Strain relief – 1 piece

Type	R 040	R 056	R 075	R 085	R 100
Part no.	60658	60657	60659	60659	60659

Chucking device set – 1 chucking device and 1 shim bolt

Type	R 040	R 056	R 075	R 085	R 100
Part no.	260430	260530	260230	260230	260330

Impact protection

Type	R 075	R 085	R 100
Part no.	260120	260240	260340

Packing unit: 5 complete items
consisting of: 10 semi-circular shells and 5 cable ties

ROBOTRAX – Cable carrier for 3D movements

Part numbers for ordering

Heat shield/Protective sleeve

Type	R 040	R 056	R 075	R 085	R 100
Part no. A	60801	60802	60803	60804	60805
Part no. B	60806	60807	60808	60809	60810

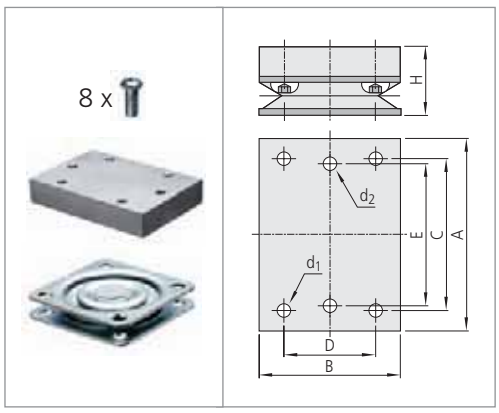
Heat shield see Part no. A
Protective sleeve see Part no. B (not illustrated)
Please specify total length or partial lengths.

Bend radius determiner

Type	R 075	R 085	R 100
Part no. 60830	160	230	280
Part no. 60831	190	265	310
Part no. 60832	220	300	340
Part no. 60833	250	335	370
Part no. 60834	280	370	400
Part no. 60835	310	405	430
Part no. 60836	340	440	460
Part no. 60837	370	475	490
Part no. 60838	400	510	520
Part no. 60839	430	545	550

Standard bend radius:

R 075: 145 mm
R 085: 175 mm
R 100: 195 mm

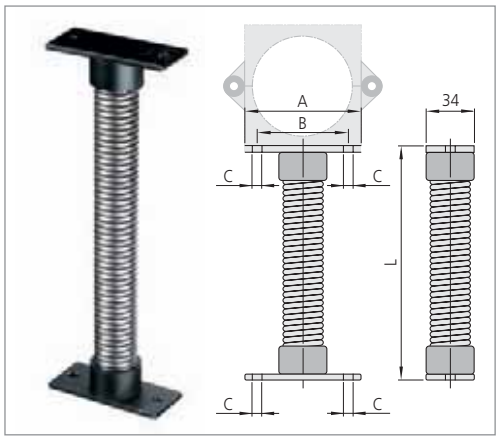


Rotary plate for quick-opening bracket

Dimensions in mm

Type	R 075	R 085	R 100
A	82	96	112
B	57	70	70
C	43	75	75
D	43	45	45
E	64	72	70
H	25	34	34
d_1	M6	M6	M6
d_2	M6	M8	M8
Part no.	260550	260560	260570

Appropriate screws are supplied with the rotary plate.



Helical spring for quick-opening bracket

Dimensions in mm

Type	R 075	R 085	R 100
A	82	96	112
B	64	72	70
C	6.5	8.5	8.5
Length L = 165 mm Part no.	60816	60820	60824
Length L = 230 mm Part no.	60817	60821	60825
Length L = 315 mm Part no.	60818	60822	60826
Length L = 465 mm Part no.	60819	60823	60827

Subject to change.