



HYDRAULIC REMOTE CONTROL

Hydraulic remote controls that Hydrocontrol work by means of direct pressure reducing valve. They are especially suitable for remote-controlling distributors, pumps and motors, in small space thus ensuring high performances, quick and reliable responses both on mobile machinery and on industrial equipment. Hydrocontrol range includes different hydraulic remote controls that are manufactured using proper material whose processing is carried out with technology methods, the most sophisticated tests and inspections, thus assuring a product at high reliability, suitable for strictest and exacting works.

QUICK REFERENCE GUIDE

Type	Description	Number of ports	Inlet pressure (bar)	Oil input capacity (l/min)	Weight (kg)	Standard threads
RCX	 2 axis single lever remote control	4	100	12	2,5	G 1/4 9/16"18 UNF
RCY	 2 axis single lever remote control reduced operating force	4	100	12	2,5	G 1/4 9/16"18 UNF
RCL	 2 axis single lever remote control with electromagnetic detent	4	40	12	2,9	G 1/4 9/16"18 UNF
RCL3	 2 axis lever + single axis lever remote control with electromagnetic detent	4 + 2	40	12	4,8	G 1/4 9/16"18 UNF
RCM	 Stackable single axis levers remote control	2	60	12	1,5	G 1/4 9/16"18 UNF
RCB	 Single axis levers two modules remote control	4	60	12	3,2	G 1/4 9/16"18 UNF

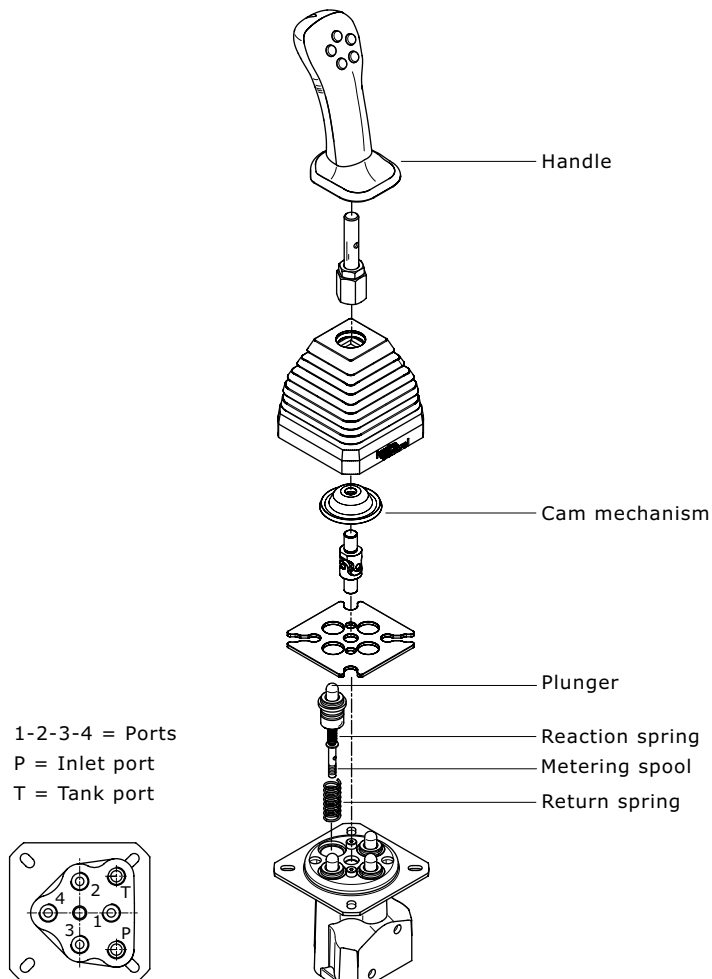


GENERAL SPECIFICATION

Description	Value
Maximum input pressure	100 bar - 1450 PSI
Maximum back pressure on tank line	3 bar - 43,5 PSI
Maximum flow on ports	12 l/min - 3 GPM
Hysteresis	< 1 bar - < 14,5 PSI
Hydraulic fluid	Mineral oil HL, HM (o HLP DIN 51524)
Fluid temperature range	-20°C / +80°C
Fluid viscosity range	10 ÷ 300 cSt
Max contamination level	9 (NAS 1638) - 20/18/15 (ISO 4406:1999)
Recommended filtration	$\beta_{10} > 75$ (ISO 16889:2008)
Leakage (singol port)	3 cc/min (with 50 bar of pressure)
Body material	Cast iron
Surface coating	Zin plated (international standards 2000/53/CE RoHS)
Plunger material	Stainless steel
Plunger guide material	Brass

OPERATING PRINCIPLE

Hydraulic remote controls and foot pedals works according to the principle of direct-acting pressure reducing valves. In rest position, the Joystick lever or kit pedal is held in neutral by return spring; inlet port P is closed and ports are connected to tank port T. By selecting control lever, plunger compresses return spring and reaction spring through cam mechanism; consequently it shifts spool and opens connection holes between inlet port P and service ports. This causes a pressure increase on service ports that is proportional to the control lever stroke and the reaction spring.





RCX 2 AXIS SINGLE LEVER REMOTE CONTROL

Hydraulic remote control RCX belongs to wide range of Hydrocontrol'e Remote Control; the lever's anti-swaying system and the ergonomic handle provides great sensitivity while manoeuvring and makes his use very comfortable for the operator. Low operating efforts, low energy consumption and low maintenance make these hydraulic remote controls RCX ideal for piloting remote control directional valves, variable displacement pumps and motors, auxiliary valves, frictions and hydraulic brakes.



TECHNICAL SPECIFICATIONS

Max pressure: **100 bar**

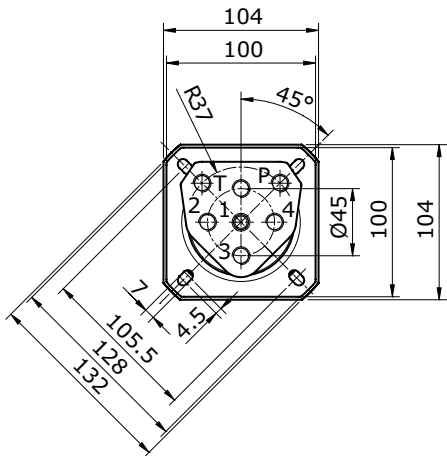
Oil capacity: **12 l/min**

Weight: **2,5 Kg**

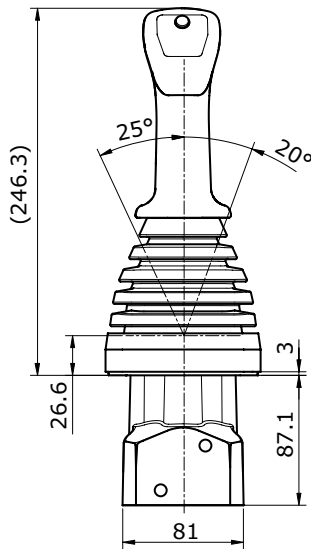
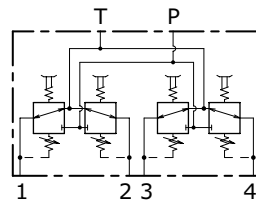
APPLICATIONS

Mini-excavators, Mini steer loaders, Backhoe loaders, Wheel loaders, Tractors, Boom mower

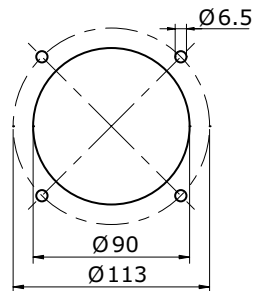
DIMENSIONS



HYDRAULIC SCHEMA



HOLDER HOLE DIMENSION



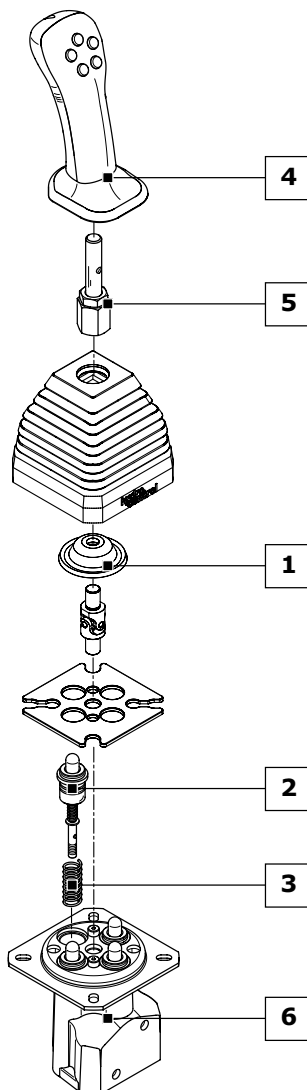


2 AXIS SINGLE LEVER REMOTE CONTROL **RCX**

ORDER EXAMPLE = **RCX: 03 - A01 - MA - F 05F 00R (2) - WF53 - RA G02**

- RCX: product type
- 1 CONTROL CLASSIFICATION:**
 - 03** control type
 - 2 METERING CURVE:**
 - A01** curve type
 - 3 RETURN SPRING:**
 - MA** return spring type
 - 4 HANDLE CLASSIFICATION:**
 - F** handle type
 - 05F** front buttons arrangement
 - 00R** rear buttons arrangement
 - (2)** handle position compared to ports
 - 5 LEVER ROD CLASSIFICATION:**
 - WF** lever rod type
 - 53** lever rod length
 - 6 BODY ARRANGEMENT:**
 - RA** body specification
 - G02** body thread

Ordering row 2 and 3, must be repeated for each port
 complete sample: **RCX: 03 A01 MA A01 MA A01 MA A01 MA F 05F 00R 2 WF53 RA G02**



1	CONTROL CLASSIFICATION: (page 12)
01	Return spring in neutral
02	Return spring in neutral with detent in only one service port
03	Return spring in neutral with square bellows for straight lever rod
04	Return spring in neutral with square bellows for bent lever rod
2	METERING CURVE: (page 70)
A01	Linear metering curve with step
B01	Linear metering curve without step
C01	Broken line metering curve with step
D01	Broken line metering curve without step
3	RETURN SPRING: (page 79)
MA	Preload 25 N - End stroke load 48 N
MB	Preload 14 N - End stroke load 27 N
MC	Preload 73 N - End stroke load 135 N
MD	Preload 89 N - End stroke load 169 N
4	HANDLE CLASSIFICATION: (page 80)
A	Without micro-switch
B	With micro-switch to close
D	With dual micro-switch
F	Ergonomic handle
K	Spherical handle
5	LEVER ROD CLASSIFICATION: (page 13)
WF53	Straight standard lever for "F" handle
WG51	Bented standard lever for "F" handle
6	BODY ARRANGEMENT: (page 15)
RA G02	Standard Body (G 1/4 ports)
RB G02	Body with shuttle valve for translation (G 1/4 ports)



RCX 2 AXIS SINGLE LEVER REMOTE CONTROL

CONTROL KIT CLASSIFICATION

All controls installed on the remote control RCX are interchangeable. Lever rod type must be chosen according to different control kit (see quick reference guide pag.13-14). The controls shown correspond to standard configurations; for different applications contact our Commercial Dept.

Code	Configuration	Dimensions	Description
03			Return spring in neutral with square bellows for straight lever rod
04			Return spring in neutral with square bellows for bent lever rod
01			Return spring in neutral with round bellows
02			Return spring in neutral with detent in only one service port NOTE: user port where to apply mechanical detent must be specified



LEVER ROD CLASSIFICATION

The lever rod kits applied to all the RCX hydraulic remote controls designed by Hydrocontrol change according to the type of control used and, above all, the type of handle. For improved clarity, all the possible lever rod configurations divided according to handle are listed here below. Straight and curved lever rods are available in several lengths and dimensions.

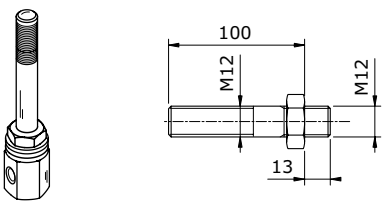
IDENTIFICATION ROD LEVER HANDLE "A-B-C-D" - QUICK REFERENCE GUIDE					
Code	Dimensional drawing	Control 01	Control 02	Control 03	Control 04
WA27		•	•		
WB52		•	•		
WD32		•	•		

IDENTIFICATION ROD LEVER HANDLE "F" - QUICK REFERENCE GUIDE					
Code	Dimensional drawing	Control 01	Control 02	Control 03	Control 04
WF53		•	•	•	
WG51		•	•		•
WH48		•	•		•

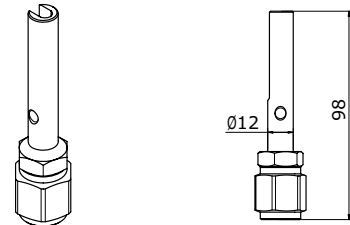
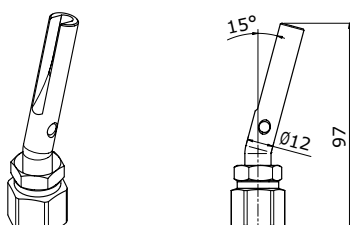
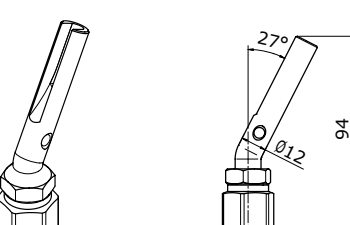


RCX 2 AXIS SINGLE LEVER REMOTE CONTROL

IDENTIFICATION ROD LEVER HANDLE "K" - QUICK REFERENCE GUIDE

Code	Dimensional drawing	Control 01	Control 02	Control 03	Control 04
WE100		•	•		

IDENTIFICATION ROD LEVER HANDLE "S" - QUICK REFERENCE GUIDE

Code	Dimensional drawing	Control 01	Control 02	Control 03	Control 04
WS76		•	•	•	
WT69		•		•	•
WU65		•		•	•



2 AXIS SINGLE LEVER REMOTE CONTROL **RCX**

BODY ARRANGEMENT

The remote hydraulic RCX body has two versions: standard body and body with shuttle valve for translation. The set-up for translation applications (code: RB) includes a flanged plate with internal shuttle valves allowing a single service port control to be split between two ports. In this way, action on the lever will generate two separate pressure signals, allowing dedicated machine translation devices to be controlled.

Code	Configuration	Dimensions	Schema	Description
RA G02				Standard body with ports G 1/4
RA U02				Standard body with ports 9/16" - 18 UNF
RB G02				Body with shuttle valve for translation with ports G 1/4
RB U02				Body with shuttle valve for translation with ports 9/16" - 18 UNF
RB01 G02				Body with shuttle valve for translation with auxiliary port (X) for Alert with ports G 1/4
RB01 U02			 (*) Chokes \varnothing 2 mm on ports 1 - 3	Body with shuttle valve for translation with auxiliary port (X) for Alert with ports 9/16" - 18 UNF

As an alternative to the "RB01" version, other set-ups are available with different flow restrictor diameters and configurations on the service ports; for more information contact our Commercial Dept.



RCY 2 AXIS SINGLE LEVER REMOTE CONTROL REDUCED OPERATING FORCE

The new RCY hydraulic remote control is an evolution of the RCX model. It adds to the variety of options and solutions offered by RCX with an upgraded hydraulic control system, allowing the operating comfort to be improved; the reduced-diameter control spool allows the required operating effort to be reduced by approximately 30%, without affecting the control, hysteresis and accuracy characteristics of this device.



TECHNICAL SPECIFICATIONS

Max pressure: **100 bar**

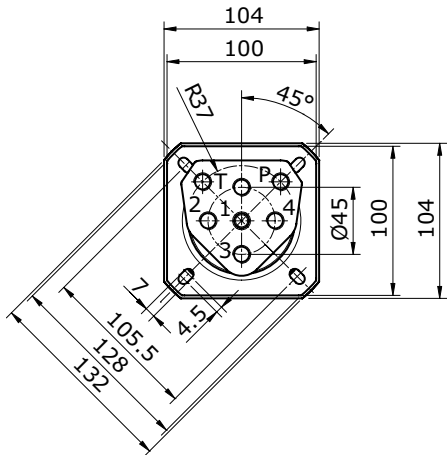
Oil capacity: **12 l/min**

Weight: **2,5 Kg**

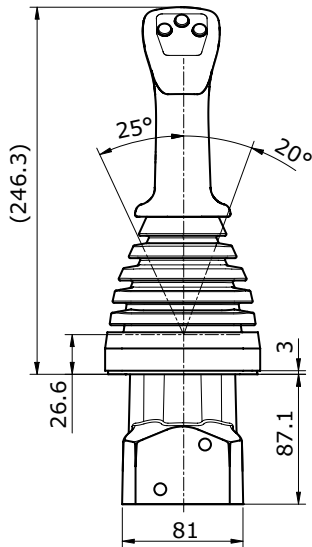
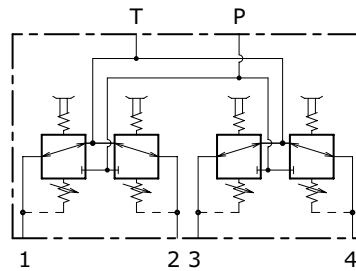
APPLICATIONS

Mini-excavators, Mini steer loaders, Backhoe loaders, Wheel loaders, Tractors, Boom mower

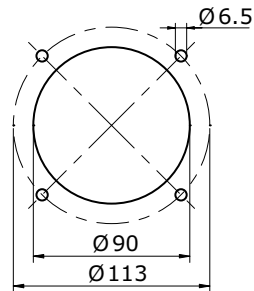
DIMENSIONS



HYDRAULIC SCHEMA



HOLDER HOLE DIMENSION





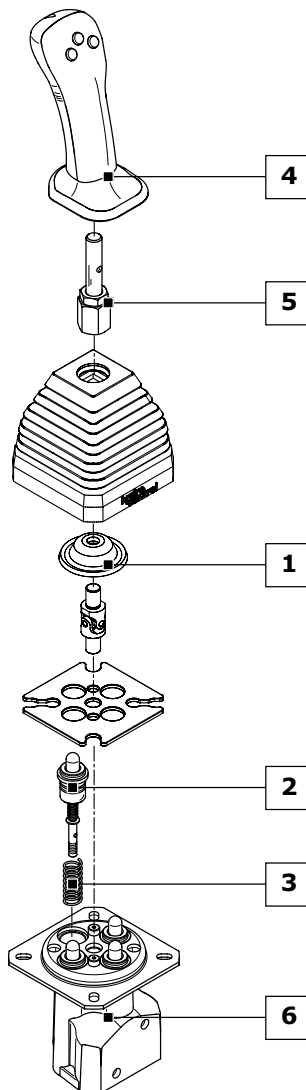
2 AXIS SINGLE LEVER REMOTE CONTROL REDUCED OPERATING FORCE **RCY**

ORDER EXAMPLE = **RCY: 03 - A01 - MB - F 03F 00R (2) - WF53 - RA G02**

- RCY product type _____
- 1) CONTROL CLASSIFICATION:** _____
- 03** control type
- 2) METERING CURVE:** _____
- A01** curve type
- 3) RETURN SPRING:** _____
- MB** return spring type
- 4) HANDLE CLASSIFICATION:** _____
- F** handle type
- 03F** front buttons arrangement
- 00R** rear buttons arrangement
- (2)** handle position compared to ports
- 5) LEVER ROD CLASSIFICATION:** _____
- WF** lever rod type
- 53** lever rod length
- 6) BODY ARRANGEMENT:** _____
- RA** body specification
- G02** body thread

Ordering row 2 and 3, must be repeated for each port

complete sample: **RCY: 03 A01 MB A01 MB A01 MB A01 MB F 03F 00R 2 WF53 RA G02**



1	CONTROL CLASSIFICATION: (page 14)
01	Return spring in neutral
02	Return spring in neutral with detent in only one service port
03	Return spring in neutral with square bellows for straight lever rod
04	Return spring in neutral with square bellows for bent lever rod
2	METERING CURVE: (page 75)
A01	Linear metering curve with step
B01	Linear metering curve without step
C01	Broken line metering curve with step
D01	Broken line metering curve without step
3	RETURN SPRING: (page 79)
MA	Preload 25 N - End stroke load 48 N
MB	Preload 14 N - End stroke load 27 N
MC	Preload 73 N - End stroke load 135 N
MD	Preload 89 N - End stroke load 169 N
4	HANDLE CLASSIFICATION: (page 80)
A	Without micro-switch
B	With micro-switch to close
D	With dual micro-switch
F	Ergonomic handle
K	Spherical handle
5	LEVER ROD CLASSIFICATION: (page 13)
WF53	Straight standard lever for "F" handle
WG51	Bented standard lever for "F" handle
6	BODY ARRANGEMENT: (page 15)
RA G02	Standard Body (G 1/4 ports)
RB G02	Body with shuttle valve for translation (G 1/4 ports)



RCL 2 AXIS SINGLE LEVER REMOTE CONTROL WITH ELECTROMAGNETIC DETENT

RCL is a remote control specifically designed for Wheel Loaders application. Based on the design of RCX, it is used for two axis control (typically boom and bucket). It includes the function of electromagnetic detent to hold the lever at the end of the stroke: this feature is requested on loaders to allow the operator to start driving while boom and bucket functions are still moving.



TECHNICAL SPECIFICATIONS

Max pressure: **40 bar**

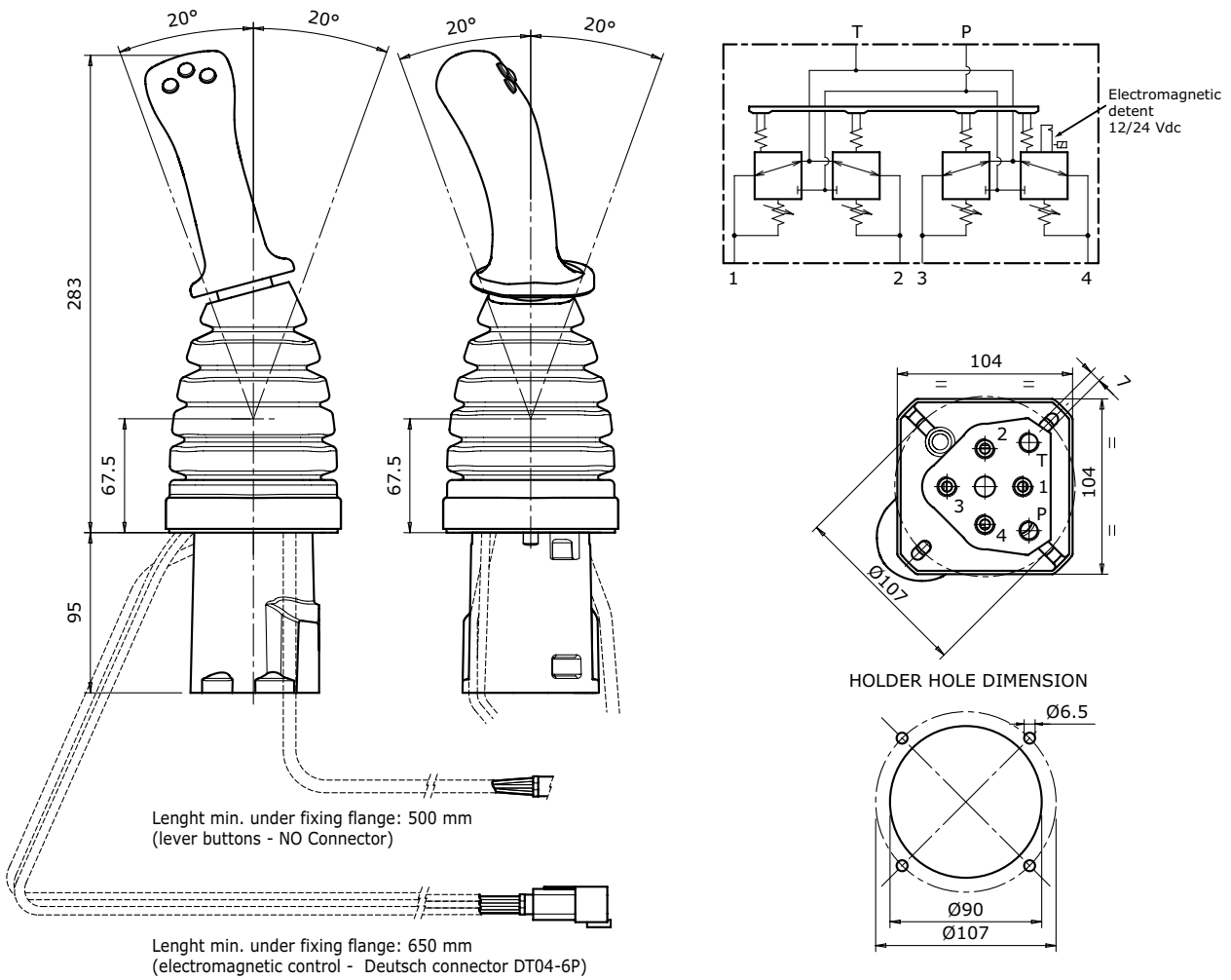
Oil capacity: **12 l/min**

Weight: **2,9 Kg**

APPLICATIONS

Wheel loaders, Skid steer loader

DIMENSIONS





2 AXIS SINGLE LEVER REMOTE CONTROL WITH ELECTROMAGNETIC DETENT

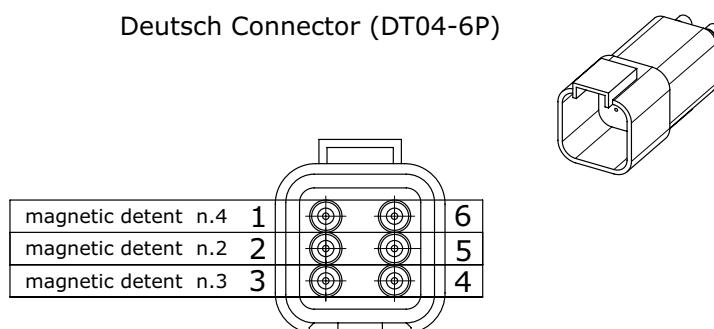
RCL

ELECTROMAGNETIC DETENT TECHNICAL SPECIFICATION

Description	Value
Supply voltage	12 Vdc +/-20% - 24 Vdc +/-20%
Resistance at 20°C	22W - 94W
Power at 20°C	7W
Duty rating	ED100%
Coil insulation class (IEC 85)	H
Connector	Deutsch DT04-6P
Connector protection (EN 60529)	IP67

A 6-pole Deutsch DT04-6P connector is always used notwithstanding the number of required electromagnetic detents. The drawing here below shows the wiring of the solenoids assembled on the service ports 2, 3 and 4. The Deutsch DT06-6S connector counterpart can be supplied on request by quoting the order code 487200906.

Deutsch Connector (DT04-6P)





RCL3 2 AXIS LEVER + SINGLE AXIS LEVER REMOTE CONTROL WITH ELECTROMAGNETIC DETENT

RCL3 is a remote control specifically designed for Wheel Loaders application. The compact design combines in a single body the two axis control (for boom and bucket) with a third axis (for auxiliary function). Electromagnetic detent is available on all ports. A security electrovalve to activate the remote control is available on request.



TECHNICAL SPECIFICATIONS

Max pressure: **40 bar**

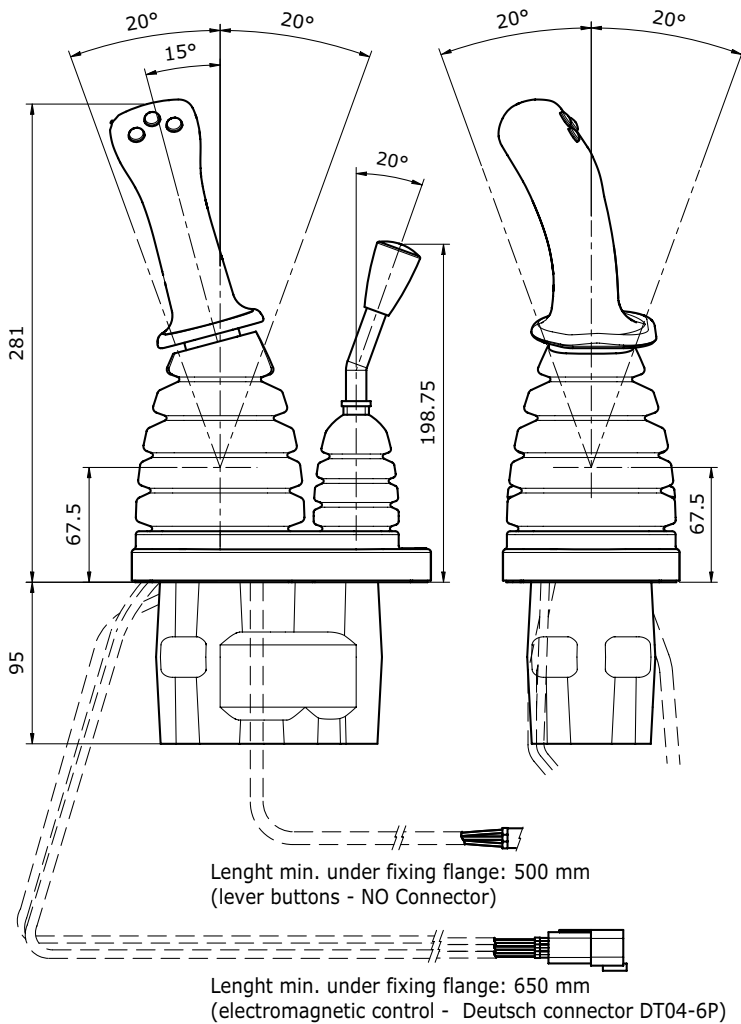
Oil capacity: **12 l/min**

Weight: **4,8 Kg**

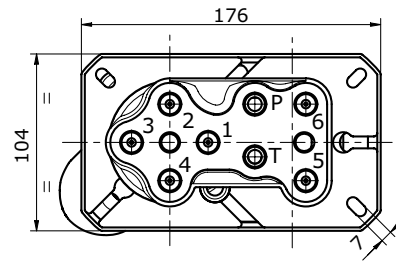
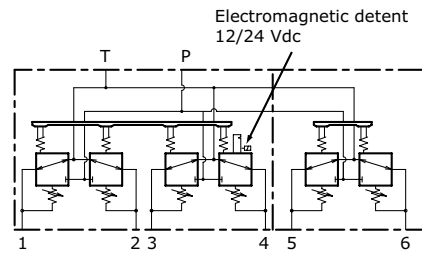
APPLICATIONS

Wheel loaders

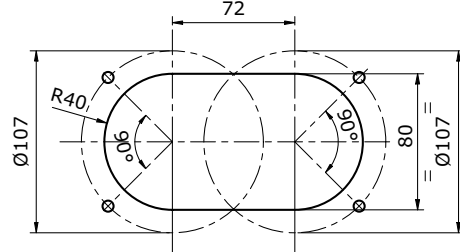
DIMENSIONS



HYDRAULIC SCHEMA



HOLDER HOLE DIMENSION





2 AXIS LEVER + SINGLE AXIS LEVER REMOTE CONTROL WITH ELECTROMAGNETIC DETENT

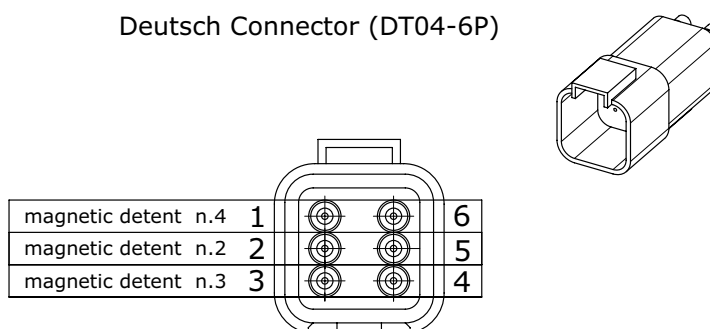
RCL3

ELECTROMAGNETIC DETENT TECHNICAL SPECIFICATION

Description	Value
Supply voltage	12 Vdc +/-20% - 24 Vdc +/-20%
Resistance at 20°C	22W - 94W
Power at 20°C	7W
Duty rating	ED100%
Coil insulation class (IEC 85)	H
Connector	Deutsch DT04-6P
Connector protection (EN 60529)	IP67

A 6-pole Deutsch DT04-6P connector is always used notwithstanding the number of required electromagnetic detents. The drawing here below shows the wiring of the solenoids assembled on the service ports 2, 3 and 4. The Deutsch DT06-6S connector counterpart can be supplied on request by quoting the order code 487200906.

Deutsch Connector (DT04-6P)



OPTIONS

The single-axis remote control is available without any detents, with electromagnetic detent or with mechanical detent.



RCM STACKABLE SINGLE AXIS LEVER REMOTE CONTROL

Hydraulic remote control RCM belongs to the wide range of Hydrocontrol products. Low operating efforts, low energy consumption and low maintenance make these hydraulic remote controls RCM ideal for piloting remote control directional valves, variable displacement pumps and motors, auxiliary valves, frictions and hydraulic brakes. Each hydraulic remote control is assembled with N.2 tie rod kits which include a tie rod, two nuts and two washers. It can be assembled up to 12 working sections.



TECHNICAL SPECIFICATIONS

Working section number: **1 - 12**

Max pressure: **60 bar**

Oil capacity: **12 l/min**

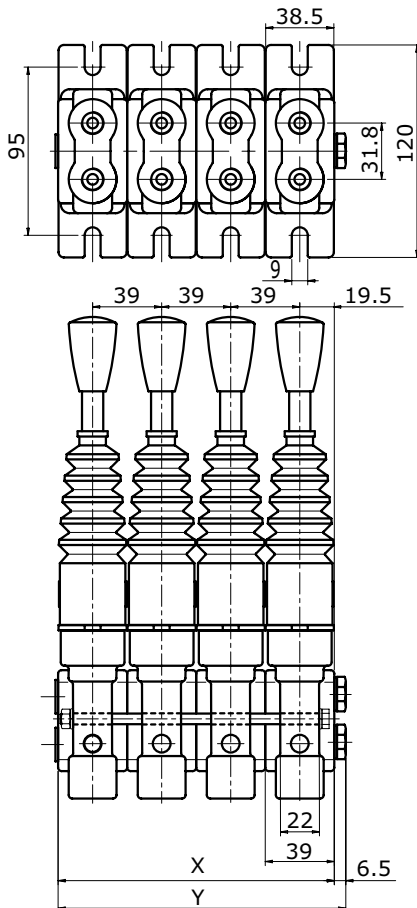
Weight RCM/1: **1,5 Kg**

Tie rod clamping torque: **14 Nm**

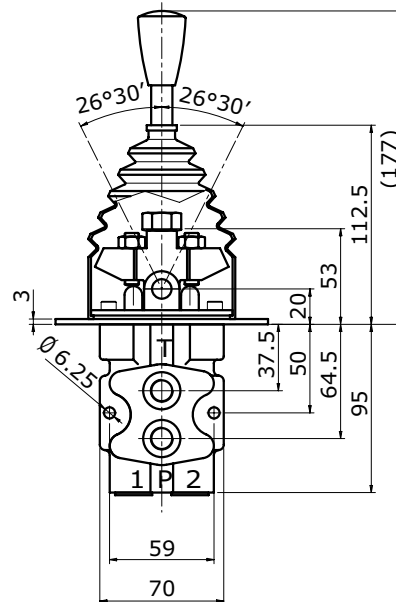
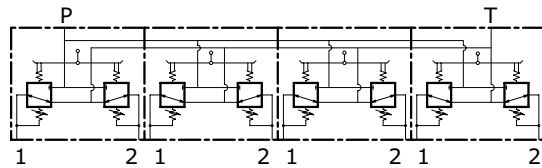
APPLICATIONS

Mini steer loaders, Backhoe loaders, Tractors

DIMENSIONS



HYDRAULIC SCHEMA

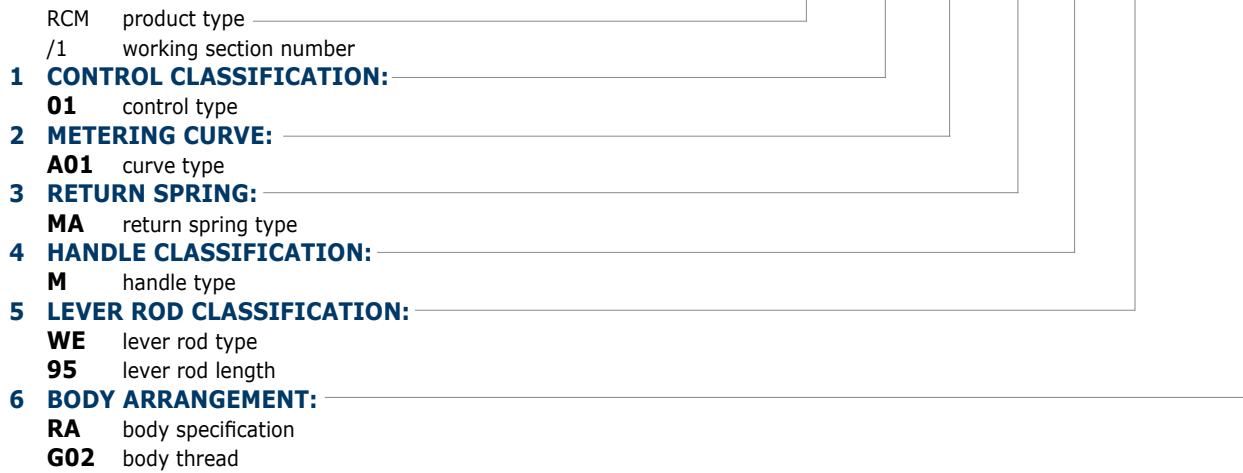


TYPE	/1	/2	/3	/4	/5	/6	/7	/8	/9	/10	/11	/12
X (mm)	39	78	117	156	195	234	273	312	351	390	429	468
Y (mm)	45,5	84,4	123,5	162,5	201,5	240,5	279,5	318,5	357,5	396,5	435,5	474,5
Weights (kg)	1,5	3	4,5	6	7,5	9	10,5	12	13,5	15	16,5	18

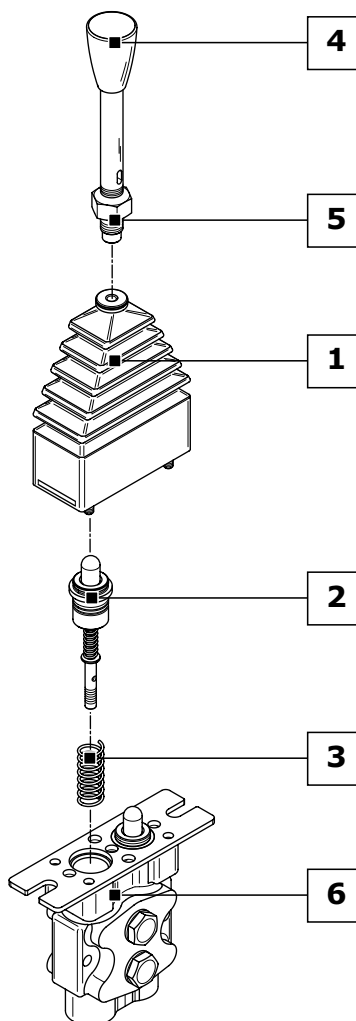


STACKABLE SINGLE AXIS LEVER REMOTE CONTROL **RCM**

ORDER EXAMPLE = RCM/1: 01 - A01 - MA - M - WE95 - RA G02



Ordering row 2 and 3, must be repeated for each port
 complete sample: **RCM/1: 01 A01 MA A01 MA A01 M WE95 RA G02**



1	CONTROL CLASSIFICATION: (page 24)
01	Return spring in neutral
02	Stroke end mechanical detent in position 1 and 2
03	Stroke end mechanical detent in position 1
04	Stroke end mechanical detent in position 2
2	METERING CURVE: (page 70)
A01	Linear metering curve with step
B01	Linear metering curve without step
C01	Broken line metering curve with step
D01	Broken line metering curve without step
3	RETURN SPRING: (page 79)
MA	Preload 25 N - End stroke load 48 N
MB	Preload 14 N - End stroke load 27 N
MC	Preload 73 N - End stroke load 135 N
MD	Preload 89 N - End stroke load 169 N
4	HANDLE CLASSIFICATION: (page 80)
A	Without micro-switch
B	With micro-switch to close
D	With dual micro-switch
M	Standard handle
5	LEVER ROD CLASSIFICATION: (page 26)
WE95	Standard lever for "M" handle (95 mm)
WE165	Standard lever for "M" handle (165 mm)
6	BODY ARRANGEMENT: (page 27)
RA G02	Standard Body (G 1/4 ports)
RA U02	Standard Body (9/16"-18 UNF ports)



RCM STACKABLE SINGLE AXIS LEVER REMOTE CONTROL

CONTROL KIT CLASSIFICATION

All controls installed on the remote control RCM are interchangeable. Lever rod type must be chosen according to different control kit (see quick reference guide pag. 27). The controls shown correspond to standard configurations; for different applications contact our Commercial Dept.

Code	Configuration	Schema	Description
01			Return spring in neutral
02			Stroke end mechanical detent in position 1 and 2
03			Stroke end mechanical detent in position 1
04			Stroke end mechanical detent in position 2
19			Return spring in neutral with micro-switch open in central position
31			Return spring in neutral with micro-switch closed in central position



STACKABLE SINGLE AXIS LEVER REMOTE CONTROL **RCM**

Code	Configuration	Schema	Description
25			Security handle in neutral
17			Security handle in neutral with micro-switch closed in central position
12			Security handle in neutral with micro-switch open in central position
26			Friction
18			Friction with micro-switch closed in central position
13			Friction with micro-switch open in central position
27			Friction and security handle in neutral




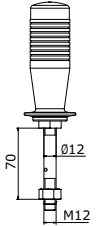

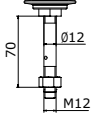
RCM STACKABLE SINGLE AXIS LEVER REMOTE CONTROL

MICROSWITCHES SPECIFICATIONS

Description	Value
Direct current load resistive	5 A / 30 Vdc
Direct current load inductive	3 A / 250 Vac
Alternative current load resistive	5 A / 30 Vdc
Alternative current load inductive	2 A / 250 Vac

LEVER ROD CLASSIFICATION

The lever rod kits applied to all the RCM hydraulic remote controls designed by Hydrocontrol change according to the type of control used and, above all, the type of handle. For improved clarity, all the possible lever rod configurations divided according to handle are listed here below. Straight and curved lever rods are available in several lengths and dimensions.

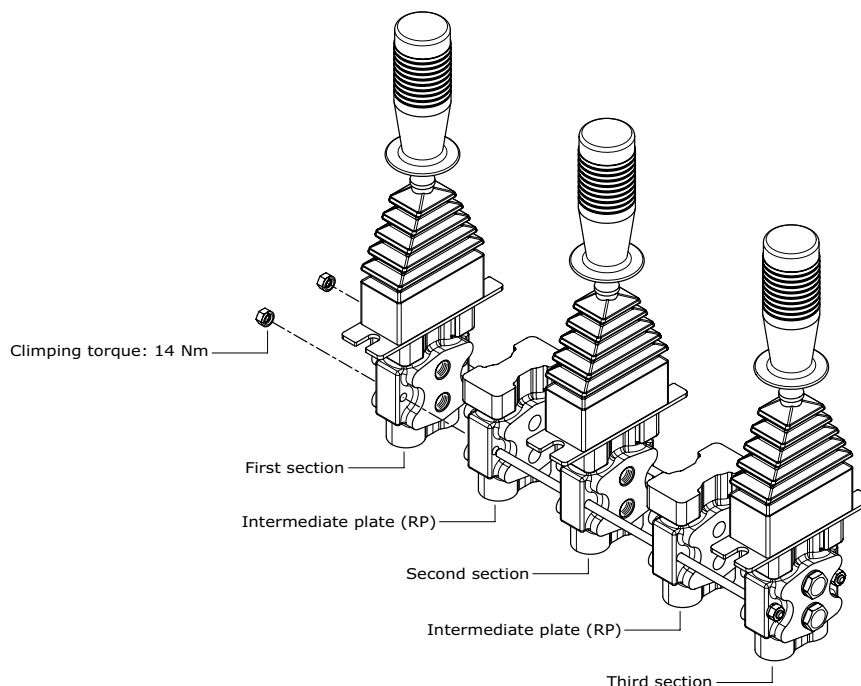
IDENTIFICATION ROD LEVER HANDLE "A-B-C-D" - QUICK REFERENCE GUIDE														
Code	Dimensional drawing	Control type												
		01	02	03	04	12	13	17	18	19	25	26	27	31
WA70			•	•	•	•		•		•	•			•
WQ70 (only for "A" handle)														•

Handles type "A-B-C-D" are only available with RCM/1. To set up an RCM remote control with any number of sections between 2 and 12, an intermediate plate must be used identified by the order code RP.

ORDER EXAMPLE RCM/3 WITH "RP" INTERMEDIATE PLATE

RCM/3: 01-A01-MA-A WA70-RA G02 - **RP** - 01-A01-MA-A WA70-RA G02 - **RP** - 01-A01-MA-A WA70-RA G02

- 1) FIRST SECTION: _____
- 2) **INTERMEDIATE PLATE:** _____
- 3) SECOND SECTION: _____
- 4) **INTERMEDIATE PLATE:** _____
- 5) THIRD SECTION: _____





STACKABLE SINGLE AXIS LEVER REMOTE CONTROL **RCM**

IDENTIFICATION ROD LEVER HANDLE "M" - QUICK REFERENCE GUIDE														
Code	Dimensional drawing	Control type												
		01	02	03	04	12	13	17	18	19	25	26	27	31
WE95		•	•	•	•		•		•	•				•
WE165		•	•	•	•		•		•	•				•
WM95							•		•					
WM165							•		•					
WN95													•	•
WR95														•

BODY ARRANGEMENT

The hydraulic remote control RCM has only one setting body, the only variable is represented by a different thread.

Code	Configuration	Schema	Description
RA G02			Standard body with ports G 1/4
RA U02			Standard body with ports 9/16" - 18 UNF



RCB SINGLE AXIS LEVERS TWO MODULES REMOTE CONTROL

Hydraulic remote control RCB belongs to the wide range of Hydrocontrol. Low operating efforts, low energy consumption and low maintenance makes these hydraulic remote controls RCB ideals for piloting remote control directional valves, variable displacement pumps and motors, auxiliary valves, frictions and hydraulic brakes. Each hydraulic remote control is assembled with N.2 tie rod kits including a tie rod, two nuts and two washers.



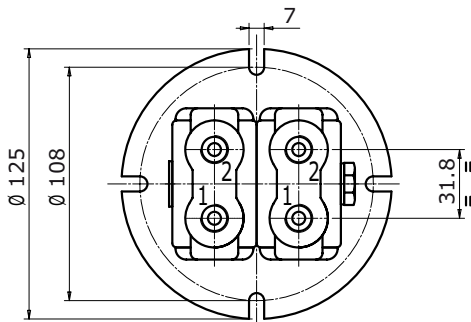
TECHNICAL SPECIFICATIONS

Working section number:	2
Max pressure:	60 bar
Oil capacity:	12 l/min
Weight:	3,2 Kg
Tie rod clamping torque:	14 Nm

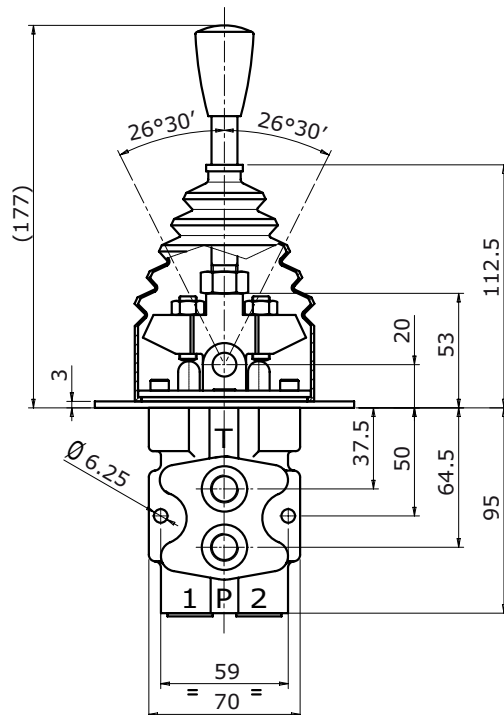
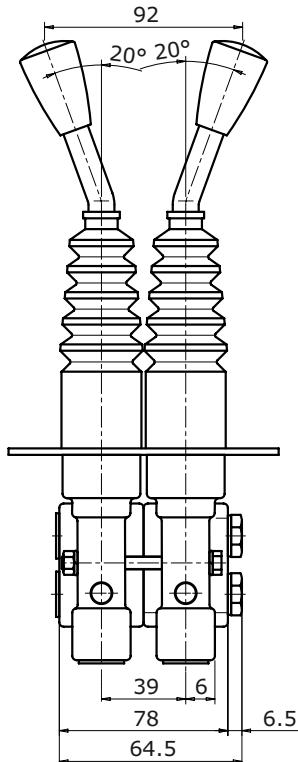
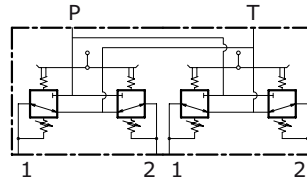
APPLICATIONS

Mini skid loaders, Backhoe loaders, Tractors

DIMENSIONS



HYDRAULIC SCHEMA



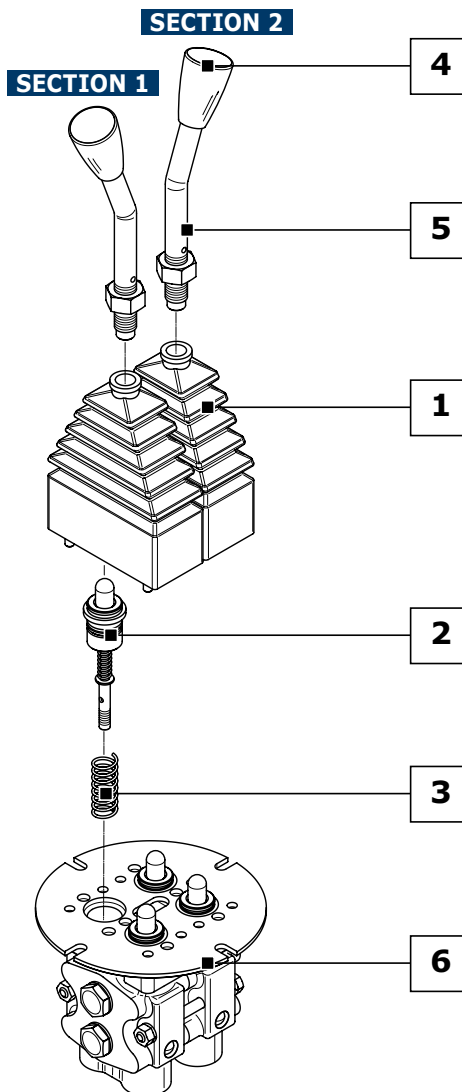


SINGLE AXIS LEVERS TWO MODULES REMOTE CONTROL

RCB

	SECTION 1	SECTION 2
ORDER EXAMPLE = RCB: 01 A01 MA M WP110 - 01 A01 MA M WP110 - RA G02		
RCB	product type	
1 CONTROL CLASSIFICATION:		
01	control type	
2 METERING CURVE:		
A01	curve type	
3 RETURN SPRING:		
MA	return spring type	
4 HANDLE CLASSIFICATION:		
M	handle type	
5 LEVER ROD CLASSIFICATION:		
WP	lever rod type	
110	lever rod length	
6 BODY ARRANGEMENT:		
RA	body specification	
G02	body thread	

Ordering row 1,2,3,4 and 5, must be repeated for each working section



1 CONTROL CLASSIFICATION:	(page 30)
01	Return spring in neutral
02	Stroke end mechanical detent in position 1 and 2
03	Stroke end mechanical detent in position 1
04	Stroke end mechanical detent in position 2
2 METERING CURVE:	(page 70)
A01	Linear metering curve with step
B01	Linear metering curve without step
C01	Broken line metering curve with step
D01	Broken line metering curve without step
3 RETURN SPRING:	(page 79)
MA	Preload 25 N - End stroke load 48 N
MB	Preload 14 N - End stroke load 27 N
MC	Preload 73 N - End stroke load 135 N
MD	Preload 89 N - End stroke load 169 N
4 HANDLE CLASSIFICATION:	(page 80)
A	Without micro-switch
B	With micro-switch to close
D	With dual micro-switch
M	Standard handle
5 LEVER ROD CLASSIFICATION:	(page 32)
WV75	Standard lever for handle type A-B-C-D (75 mm)
WP110	Standard lever for handle type M (110 mm)
6 BODY ARRANGEMENT:	(page 33)
RA G02	Standard Body (G 1/4 ports)
RA U02	Standard Body (9/16"-18 UNF ports)



RCB SINGLE AXIS LEVERS TWO MODULES REMOTE CONTROL

CONTROL KIT CLASSIFICATION

All controls installed on the remote control RCB are interchangeable. Lever rod type must be chosen according to different control kit (see quick reference guide pag. 32). The controls shown correspond to standard configurations; for different applications contact our Commercial Dept.

Code	Configuration	Schema	Description
01			Return spring in neutral
02			Stroke end mechanical detent in position 1 and 2
03			Stroke end mechanical detent in position 1
04			Stroke end mechanical detent in position 2
05			Security handle in neutral
06			Friction



SINGLE AXIS LEVERS TWO MODULES REMOTE CONTROL

RCB

Code	Configuration	Schema	Description
12			Security handle in neutral with micro-switch open in central position
18			Friction with micro-switch closed in central position

MICROSWITCHES SPECIFICATIONS

description	Value
Direct current load resistive	5 A / 30 Vdc
Direct current load inductive	3 A / 250 Vac
Alternative current load resistive	5 A / 30 Vdc
Alternative current load inductive	2 A / 250 Vac



RCB SINGLE AXIS LEVERS TWO MODULES REMOTE CONTROL

LEVER ROD CLASSIFICATION

The lever rod kits applied to all the RCB hydraulic remote controls designed by Hydrocontrol change according to the type of control used and, above all, the type of handle. For improved clarity, all the possible lever rod configurations divided according to handle are listed here below. Straight and curved lever rods are available in several lengths and dimensions.

IDENTIFICATION ROD LEVER HANDLE "A-B-C-D" - QUICK REFERENCE GUIDE

Code	Dimensional drawing	Control type							
		01	02	03	04	05	06	12	18
WV75		•	•	•	•		•		•

IDENTIFICATION ROD LEVER HANDLE "M" - QUICK REFERENCE GUIDE

Code	Dimensional drawing	Control type							
		01	02	03	04	05	06	12	18
WP110		•	•	•	•		•		•
WT110						•		•	



SINGLE AXIS LEVERS TWO MODULES REMOTE CONTROL **RCB**

BODY ARRANGEMENT

The hydraulic remote control RCB has only one setting body, the only variable is represented by a different thread.

Code	Configuration	Schema	Description
RA G02			Standard body with ports G 1/4
RA U02			Standard body with ports 9/16" - 18 UNF

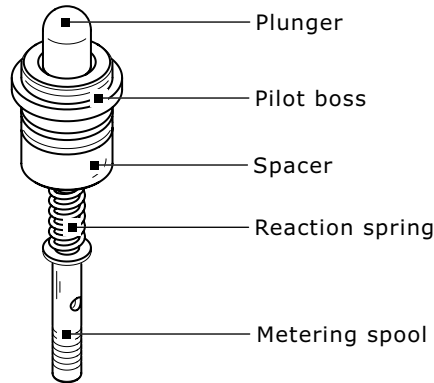


METERING CURVE CLASSIFICATION

All the Hydrocontrol servo control configurations imply the choice of a "metering curve" kit; the number of metering curves changes according to the number of product service ports. The metering curve classification depends on the working pressure (measured in bars) and stroke length (measured in mm).

The sketch here below shows a typical metering curve and the list of available curves.

For information on the complete list of curves, contact the manufacturer's Commercial department.



Type	Diagram	Description		
A	<p style="text-align: center;">Pressure (bar)</p> <p style="text-align: center;">Stroke (mm)</p>	Linear metering curve with step		
CODE	PRESSURE		STROKE	
	A (bar)	B (bar)	C (mm)	D (mm)
A01	5,8	19,5	1,5	7,5
A02	5	25	1,5	7,5
A03	2	13	1,5	7,5
A04	6	40	1,5	7,5
A05	0	64	1,5	7,5
A06	4	17	1,5	7,5
A07	5	15	1,5	7,5
A08	2	18	1,5	7,5
A09	5	20	1,5	6
A10	2	8	1,5	7,5
A11	4	10	1,5	7,5
A12	11,5	32	1,5	7,5
A13	10	20	1,5	7,5
A14	7	17	1,5	7,5
A15	7,5	29	1,5	7,5



CODE	PRESSURE		STROKE	
	A (bar)	B (bar)	C (mm)	D (mm)
A16	6	22	1,5	7,5
A17	0	20	1	7,5
A18	4	16	1,5	7
A19	6	20,6	1,5	7
A20	8	28	1,5	7,5
A21	5	20,5	1,5	7,5
A22	5,8	18,3	1,5	7
A23	6,8	23,5	1	7,5
A24	5,8	19,2	1	9,5
A25	4,4	17,9	1	6,5
A26	2,8	20,8	1,5	10
A27	5,7	19,1	1,5	7,5
A28	3	16,2	1,5	7,5
A29	8	27,6	1,5	9,5
A30	5,8	15,5	1,5	7,5
A31	5,6	25,2	1,5	7,5
A32	7	15,5	1,2	7,5
A33	10,7	27,5	1	7,5
A34	0	28	1,5	7,5
A35	5,8	24	1,5	9,5
A36	7,4	21	1,5	7,5
A38	7,5	17,7	1,5	7,5
A39	6,6	16,4	1,5	7,5
A40	6,5	11,6	1,5	7,5
A41	5,9	17,4	1,5	7,5
A42	6,6	16,3	1,5	9,5
A43	3	22,2	1,5	7,5
A44	14,5	26,9	1	7,5
A45	8,7	39,2	1,5	7,5
A46	4	22	1,5	7,5
A47	14,7	28,4	1,5	7,5
A48	5	74	1	7,5
A49	0	34	1,5	7,5
A51	7,3	21,7	1,5	7
A52	10	79	1	7,5
A54	4	20	1,5	7,5
A55	3	20	4,5	7,5
A56	5	20	1,5	4,5
A61	5	19	1,5	7
A62	8	22	1,5	7,5
A64	6,8	26	1,5	7,5
A65	6,8	24,4	1,5	7
A67	2,5	14	1	7,5
A68	7,5	20,9	1,5	9,5
A99	6	19	1	3,5



Type	Diagram	Description		
B		Linear metering curve without step		
CODE	PRESSURE		STROKE	
	A (bar)	B (bar)	C (mm)	D (mm)
B01	5	22	1,5	8
B02	5	19	1,5	8
B03	5	16	1,5	8
B04	2	16,5	1,5	8
B05	7,5	32,5	1	8
B06	5	20	1	8
B07	4	10,5	1,5	8
B08	3	14,5	1,5	8
B09	6	24,3	1	8
B10	2	19,3	1,5	8
B11	7,1	21,9	1	8
B12	8,3	23,2	1	8
B13	7,9	23,6	1	8
B14	6	23	1,5	8
B15	10,2	25,8	1	8
B16	6,9	12,4	1,5	8
B17	2,1	20,3	1	8
B18	5,8	27	1,5	8
B19	3,2	24,4	1,5	8
B20	2	8,5	1,5	8
B21	2	13,7	1,5	8
B22	5,8	16,4	1,2	7,7
B23	4	18	1,5	8
B24	10,2	25,1	1	8
B25	4,5	23,9	1,5	8
B27	7,5	18,9	1	8
B29	3	23,8	1,5	8
B30	6	42	1,5	8
B31	4	29	1	8
B35	6,5	20	1	8
B36	7,8	20,2	1	8
B98	6	14,5	1,2	8
B99	4,5	14,5	1,5	8



Type	Diagram	Description																																																																																								
C		Broke line metering curve with step																																																																																								
	<table border="1"> <thead> <tr> <th rowspan="2">CODE</th> <th colspan="3">PRESSURE</th> <th colspan="3">STROKE</th> </tr> <tr> <th>A (bar)</th> <th>B (bar)</th> <th>C (bar)</th> <th>D (mm)</th> <th>E (mm)</th> <th>F (mm)</th> </tr> </thead> <tbody> <tr><td>C01</td><td>2</td><td>6</td><td>15</td><td>1,5</td><td>5</td><td>7,5</td></tr> <tr><td>C02</td><td>3</td><td>7</td><td>16</td><td>1,5</td><td>5</td><td>7,5</td></tr> <tr><td>C03</td><td>7</td><td>18</td><td>27</td><td>0,5</td><td>4,8</td><td>6,5</td></tr> <tr><td>C04</td><td>7</td><td>18</td><td>27</td><td>0,5</td><td>6,3</td><td>8</td></tr> <tr><td>C05</td><td>5</td><td>11</td><td>18</td><td>1</td><td>5</td><td>7,5</td></tr> <tr><td>C07</td><td>4,2</td><td>9</td><td>20</td><td>1,5</td><td>5</td><td>7,5</td></tr> <tr><td>C08</td><td>6,5</td><td>11</td><td>18,5</td><td>1</td><td>5</td><td>7,5</td></tr> <tr><td>C10</td><td>5,4</td><td>10,9</td><td>17,3</td><td>1</td><td>5</td><td>7,5</td></tr> <tr><td>C11</td><td>4,2</td><td>9</td><td>20</td><td>1,5</td><td>5</td><td>7,5</td></tr> <tr><td>C98</td><td>1</td><td>2,5</td><td>9</td><td>1</td><td>4,2</td><td>8,5</td></tr> <tr><td>C99</td><td>1</td><td>2,5</td><td>9</td><td>1</td><td>4,2</td><td>9</td></tr> </tbody> </table>		CODE	PRESSURE			STROKE			A (bar)	B (bar)	C (bar)	D (mm)	E (mm)	F (mm)	C01	2	6	15	1,5	5	7,5	C02	3	7	16	1,5	5	7,5	C03	7	18	27	0,5	4,8	6,5	C04	7	18	27	0,5	6,3	8	C05	5	11	18	1	5	7,5	C07	4,2	9	20	1,5	5	7,5	C08	6,5	11	18,5	1	5	7,5	C10	5,4	10,9	17,3	1	5	7,5	C11	4,2	9	20	1,5	5	7,5	C98	1	2,5	9	1	4,2	8,5	C99	1	2,5	9	1
CODE	PRESSURE			STROKE																																																																																						
	A (bar)	B (bar)	C (bar)	D (mm)	E (mm)	F (mm)																																																																																				
C01	2	6	15	1,5	5	7,5																																																																																				
C02	3	7	16	1,5	5	7,5																																																																																				
C03	7	18	27	0,5	4,8	6,5																																																																																				
C04	7	18	27	0,5	6,3	8																																																																																				
C05	5	11	18	1	5	7,5																																																																																				
C07	4,2	9	20	1,5	5	7,5																																																																																				
C08	6,5	11	18,5	1	5	7,5																																																																																				
C10	5,4	10,9	17,3	1	5	7,5																																																																																				
C11	4,2	9	20	1,5	5	7,5																																																																																				
C98	1	2,5	9	1	4,2	8,5																																																																																				
C99	1	2,5	9	1	4,2	9																																																																																				

Type	Diagram	Description																																							
D		Broke line metering curve without step																																							
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CODE	PRESSURE			STROKE																																					
	A (bar)	B (bar)	C (bar)	D (mm)	E (mm)	F (mm)																																			
D01	2	6	15	1,5	5	8																																			
D02	4,2	9	22	1	5	8																																			
D04	5	16,2	20	1,5	7,5	8																																			
D07	4,2	9	22,2	1,5	5	8																																			



METERING CURVE CLASSIFICATION FOR FOOT PEDAL RCS - RCT

The RCS and RCT tilting foot controls imply the use of limited-stroke dedicated curves guaranteeing improved control ergonomics. Metering curves are available equipped with a swing-preventing dampening device; for more informations contact our Commercial Dept.

Type	Diagram	Description		
A		Linear metering curve with step		
CODE	PRESSURE		STROKE	
	A (bar)	B (bar)	C (mm)	D (mm)
A01T	5,8	19,5	1	5
A02T	5	25	1	5
A06T	4	17	1	5
A07T	5	15	1	5
A16T	6	22	1	5
A20T	8	28	1	5
A52T	5	22	1	5
A53T	6	26	1	5



Type	Diagram	Description		
B	<p>Pressure (bar) B</p> <p style="text-align: center;">C D Stroke (mm)</p>	<p>Linear metering curve without step</p>		
CODE	PRESSURE		STROKE	
	A (bar)	B (bar)	C (mm)	D (mm)
B03T	5	16	1	5,5
B14T	6	23	1	5,5
B23T	4	18,6	1,5	5
B32T	5	27,5	1,5	5
B40T	6	18,7	1	4,2



METERING CURVE CLASSIFICATION FOR HYDRAULIC REMOTE CONTROL RCL - RCY

The RCL and RCY hydraulic remote controls imply the use of dedicated curves, specially designed to reduce actuation forces. The available choices are shown here below.

Type	Diagram	Description		
A	<p>Pressure (bar)</p> <p>B</p> <p>A</p> <p>C D Stroke (mm)</p>	Linear metering curve with step		
CODE	PRESSURE		STROKE	
	A (bar)	B (bar)	C (mm)	D (mm)
A01	5,8	19,5	1,5	7,5
A02	5	25	1,5	7,5
A06	4	17	1,5	7,5
A07	5	15	1,5	7,5
A14	7	17	1,5	7,5
A21	5	20,5	1,5	7,5
A23	6,8	23,5	1	7,5
A24	5,8	19,2	1,5	9,5
A35	5,8	24	1,5	9,5
A36	7,4	21	1,5	7,5
A37	7,3	19,3	1,5	7
A47	14,7	28,4	1,5	7,5
A50	5	26,8	1	7,5
A53	6	26	1,5	7,5
A54	4	20	1,5	7,5
A57	6,6	22,7	1,5	7,5
A59	5	26,8	1	6,5
A60	5	26,8	1	8,5
A65	6,5	23,7	1,5	7,5
A69	5,6	21,6	1,5	7,5
A70	6,5	23,7	1	7,5
A71	6,9	25,2	1,5	9,5
A72	9,2	27,5	1,5	9,5



Type	Diagram	Description		
B	<p>Pressure (bar) B A C D Stroke (mm)</p>	Linear metering curve without step		
CODE	PRESSURE		STROKE	
	A (bar)	B (bar)	C (mm)	D (mm)
B06	5	20	1	8
B09	6	24,3	1	8
B28	8,2	26,8	1	8
B33	5,9	24,8	1,5	8
B37	5	15,8	1,5	8
B38	6,3	21,2	1,5	8
B39	2,7	15	1,5	8
B41	5	26,6	1,5	8
B42	5,8	25,1	1,5	10

Type	Diagram	Description				
D	<p>Pressure (bar) C B A D E F Stroke (mm)</p>	Broke line metering curve without step				
CODE	PRESSURE			STROKE		
	A (bar)	B (bar)	C (bar)	D (mm)	E (mm)	F (mm)
D03	5,2	14,4	30,9	1,5	5	8

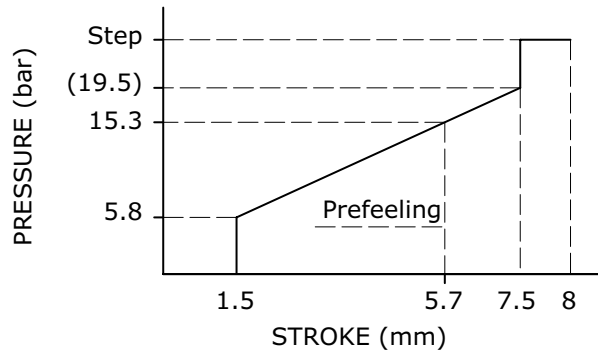


PREFEELING - MECHANICAL DETENT

The prefeeling function enables users to safely lock the lever adjustment without accidentally reaching the point of detent. When choosing from the metering curves shown, the reduced adjustment stroke should be taken into consideration, and a curve should be chosen allowing the required pressure value to be reached at the prefeeling stage.

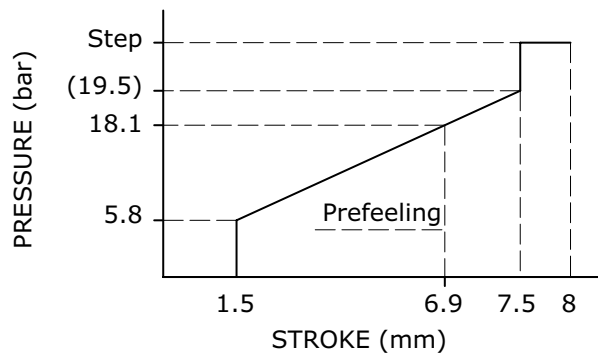
The RCX and RCY hydraulic remote controls have a prefeeling setting at 5.7 mm along the stroke in combination with the mechanical detent (code 02).

The RCX, RCY prefeeling effect on the A01 curve is shown by way of example.



Similarly, the RCM and RCB hydraulic remote controls have a prefeeling setting at 6.9 mm along the stroke in combination with the mechanical detents (codes 02, 03 and 04).

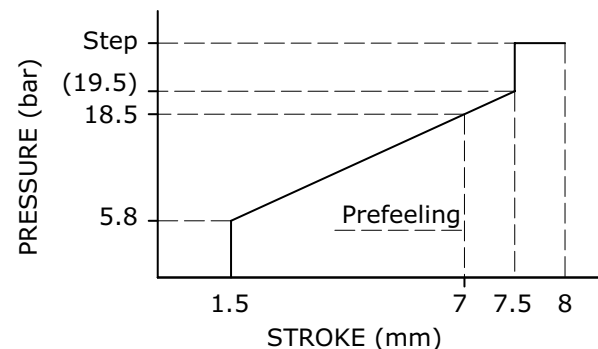
The RCM, RCB prefeeling effect on the A01 curve is shown by way of example.



PREFEELING - ELECTROMAGNETIC DETENT

The RCL and RCL3 hydraulic remote controls are designed with prefeeling before the electromagnetic detent point is reached. In this case, the prefeeling is set at 7 mm along the stroke.

The RCL, RCL3 prefeeling effect on the A01 curve is shown by way of example.

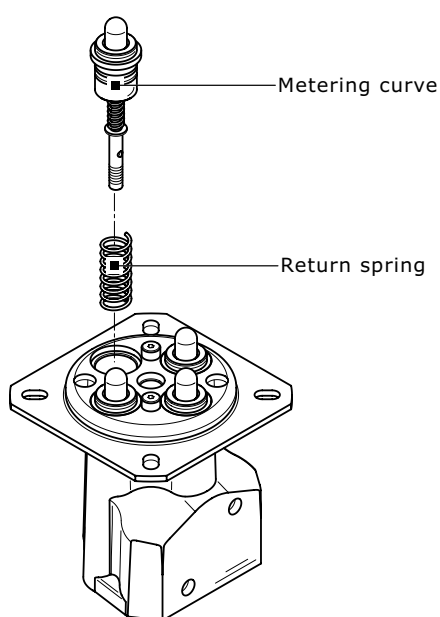




RETURN SPRING CLASSIFICATION

For all the servo control configurations designed by Hydrocontrol, in each service port and on the relevant metering curve, a return spring must be selected.

The exploded view here below shows the example configuration of a 4 service port remote control; as you can see, a return spring is pictured at each metering curve. 4 types of return spring are currently available (see table).



CODE	PRELOAD	END STROKE LOAD
MA	25 N	48 N
MB	14 N	27 N
MC	73 N	135 N
MD	89 N	169 N

RETURN SPRING CLASSIFICATION FOR RCS AND RCT

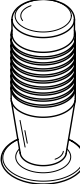
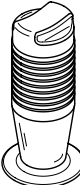


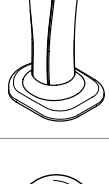



The range of RCS and RCT tilting foot controls only includes the MD type return spring. The relative values are shown here below.

CODE	PRELOAD	END STROKE LOAD
MD	94 N	149 N



HANDLES CLASSIFICATION

All the hydraulic remote controls manufactured by Hydrocontrol can be set up to have different handles according to the system dimensions and applications. All the handles in the range are shown here below; for each handle, the corresponding operation is also pictured. The choice of a handle will also influence the choice of a lever kit.

HANDLE IDENTIFICATION - QUICK REFERENCE GUIDE								
Type	Description	RCX	RCY	RCL	RCL3	RCM	RCB	
A	 Handle without micro-switch	•	•			•		
B	 Handle with micro-switch to close	•	•			•		
C	 Handle with micro-switch to close with detent	•	•			•		
D	 Handle with dual micro-switch	•	•			•		
F	 Ergonomic handle	•	•	•	•			
M	 Handle with lens					•	•	
S	 Ergonomic handle slim	•	•	•				
K	 Spherical handle	•	•					



HANDLES "A - B - C - D"

The handle families identified with A, B, C and D have been designed to equip the vast range of earth-moving machines including mini-excavators, mini-loaders, brush cutters, backhoe loaders, tractors, etc.

These handles can be set up to have – or not – a microswitch.

The hydraulic remote controls most suitable for fitting these handles are HC-RCX, HC-RCY and HC-RCM.

Type	Description	Dimensions	Configuration
A	without micro-switch (standard)		
B	with micro-switch to close		
C	with micro-switch to close with detent		
D	with dual micro-switch		

HANDLES MICROSWITCH BREAKING B - C - D

MICROSWITCH SPECIFICATIONS	
Direct current load resistive	4.8 A 30 Vdc
Alternative current load resistive	1.5 A 30 Vdc
TECHNICAL SPECIFICATIONS	
Hande protection	IP 40



HANDLE "F"

This handle has been designed to be used on our remote controls type RCX. Its ergonomics, the accurate buttons position and dimensions make its use comfortable and restful. It can be supplied with 7 microswitches in different combinations together with a push button for safety.

Type	Description	Dimensions	Configuration
F	Ergonomic handle		

TECHNICAL SPECIFICATIONS

BUTTONS COLOURS	
Type A	red
Type B - C	yellow
Type D - E	green
Type F - G	grey
Type H (push button for safety)	black
MICROSWITCH SPECIFICATIONS	
Direct current load resistive	5 A 30 Vdc
Direct current load inductive	3 A 30 Vdc
TECHNICAL SPECIFICATIONS	
Handle protection	IP 65
Cable section	0,5 mm ²
Useful cable length	700 mm

ORDER EXAMPLE HANDLE "F"

05F - 01R - 2 - WF53

- 1 **FRONT BUTTONS ARRANGEMENT:** _____
- 05F** arrangement with 5 front buttons
- 2 **REAR BUTTONS ARRANGEMENT:** _____
- 01R** arrangement with 1 rear button
- 3 **HANDLE POSITION (RESPECT TO THE BODY):** _____
- 2** return spring type
- 4 **LEVER ROD CLASSIFICATION:** _____
- WF53** type and length rod lever straight
- WG51** type and length rod lever bent
- WH48** type and length rod lever bent



FRONT BUTTONS ARRANGEMENT		
Code	Drawing	Schema
00F		
01F		
02F		
03F		
04F		
05F		

REAR BUTTONS ARRANGEMENT		
Code	Drawing	Schema
00R		
01R		
02R		
03R		
04R		
05R		



HC-SADR2 SILENT ALERTER DRIVER - HANDLE "F" WITH VIBRATION

SADR2 with vibration (silent alarm) is an ergonomic handle which, via a 'dead man' control, can transmit different frequency vibrations to the operator's hand. The handle can be equipped with up to three microswitches in its front side, while the rear side is always equipped with the 'dead man' control button; the special mechanical control design of the "Dead Man" button is necessary for vibration transmission. In addition to transmitting the required vibration, this button also works as an active button.

APPLICATION FIELD

The vibrating handle can be used to control crane trucks when the crane operator is not in a position to visually supervise the hanging load movement; in this case, the different-frequency vibration conveys to the operator information regarding the load movement and speed when visual or acoustic alarms would not be equally effective.

TECHNICAL SPECIFICATIONS

ELECTRIC	
Operating voltage	19.2 - 28.8 Vdc
Max current consumption (in standby)	80 mA
INPUT	
Input pulse frequency	0 - 65 Hz
Input pulse high level	17 - 28.8 Vdc
OUTPUT	
Alerting frequency	0 - 65 Hz
Max soenoid current (RMS)	800 mA
Protections	Reverse battery, "load-dump"
EM Immunity	30 V/m
MECHANICAL - ENVIRONMENTAL	
Operating temperature	-40 / +85 °C
Connections	Not terminated 3 conductors shielded cable
APPLIED STANDARDS	
EMC - Agricultural and forestry machines	EN 14982
EMC - Earth moving machinery	ISO 13766

ORDER EXAMPLE - "F" HANDLE WITH VIBRATION

The front of the handle can be equipped with up to 3 microswitches.

The order code are: **00F - 01F - 02F - 03F**

The choice of vibration corresponds to the ordering code 06R

02F - 06R - 2 - WF53

1 FRONT BUTTONS ARRANGEMENT: _____

02F arrangement with 2 front buttons

2 REAR BUTTONS ARRANGEMENT: _____

06R arrangement with vibration

3 HANDLE POSITION (RESPECT TO THE BODY): _____

2 handle position

4 LEVER ROD CLASSIFICATION: _____

WF53 type and length rod lever straight
WG51 type and length rod lever bent
WH48 type and length rod lever bent



HANDLE POSITION "F" (RESPECT TO THE BODY)					
Code	Configuration		Code	Configuration	
1			5		
2			6		
3			7		
4			8		



HANDLE "S"

This handle has been designed to be used on our remote controls type RCX. Its small size and low cost make this handle a competitive alternative for all off-highway machines manufacturers. The handle is equipped with a top push button (3A / 125 Vac).

Type	Description	Dimensions	Configuration
S	Ergonomic handle slim		

ORDER EXAMPLE HANDLE "S"

2 - WS76

- 1 HANDLE POSITION (RESPECT TO THE BODY):** _____
- 2 LEVER ROD CLASSIFICATION:** _____
- WS76** type and length rod lever straight
 - WT69** type and length rod lever bent
 - WU65** type and length rod lever bent

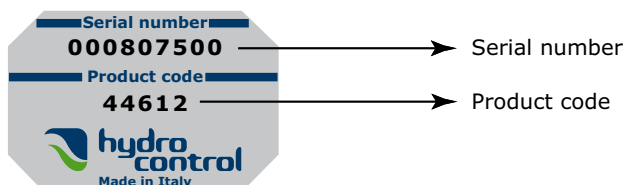
HANDLE POSITION "S" (RESPECT TO THE BODY)			
Code	Configuration	Code	Configuration
1		5	
2		6	
3		7	
4		8	



GENERAL CONDITIONS AND PATENTS

PRODUCT IDENTIFICATION

All Hydrocontrol products have an identifying plate placed in specific position.



SERIAL NUMBER:

It univocally identifies the physical valve: this provides an easy way to find all sales and production details.

PRODUCT CODE:

It is a number univocally identifying the configuration and pressure settings of a valve.

INTRODUCTION

These general conditions apply to all general supplies from Hydrocontrol s.p.a., after receiving orders from the Customer. Should commercial terms such as EXW, DDP, etc be mentioned, of course the Incoterms of the International Chamber of Commerce must be referred to, according to the test existing when the general supply conditions are agreed on.

MANAGEMENT OF ORDERS

No Customer's order is binding to Hydrocontrol s.p.a. if Hydrocontrol s.p.a. has not confirmed the order in writing. Hydrocontrol s.p.a. commits to supplying the orders in compliance with the order confirmation that has been issued. Any disagreement with the content of the order confirmation must be communicated in writing to Hydrocontrol s.p.a. within and no later than 5 days from the delivery of the order confirmation. The Customer commits to paying for the goods supplied by Hydrocontrol s.p.a., according to the prices indicated on the order confirmation.

PAYMENT CONDITIONS

The Parties agree on the payment terms at the beginning of the supply. The terms will be indicated on the order confirmation. Should the Customer be late with the payments, Hydrocontrol S.p.a. will be entitled to require the payment of interests on arrears based on the exiting Prime Rate increased by 2%. Should there be any payment delay, Hydrocontrol s.p.a. will be entitled not to process the Customer's purchase order, even if it has already been confirmed.

DELIVERY AND SHIPMENT

The goods are always supplied Ex Works, even when Hydrocontrol s.p.a. agrees with the Customer that the shipment, or a part of it, will be arranged by Hydrocontrol s.p.a. It is agreed that the Customer will bear the risk of goods deterioration or damaging from the moment the goods are handed by Hydrocontrol s.p.a. to the first carrier.

PRODUCT CHARACTERISTICS

Hydrocontrol s.p.a. commits to supplying good quality products, compliant with the technical specifications declared on the technical tables and on the catalogue. Hydrocontrol s.p.a, even without notice, at its own discretion, reserves the right to modify the products as necessary, without these changes altering the main characteristics of the products.

CLAIMS

Any claims about defects on delivered products (just as an example: claims about the packaging, the number, the quantity or the external product characteristics) will have to be notified to Hydrocontrol s.p.a. in writing, within and no later than 7 days from reception of the goods, otherwise the claims will be considered as null and void. Occult defects (the defects of the goods that cannot be spotted with a careful control of the goods received by the Customer), will have to be notified in writing to Hydrocontrol s.p.a. within 7 days from the discovery of the defect, and anyhow no later than 12 months from the delivery of the goods, otherwise the claim will be considered as null and void. Even in case of claim or objection, the Customer will never be entitled to suspend or delay the payments to Hydrocontrol s.p.a. for the products subject to claim or objection nor for any other supply.