

TSM Spraybooms



Date **Season 2022-2023**

Subject **Spraybooms**

Place Kverneland Group Nieuw Vennepe
Hoofdweg 1278
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The Netherlands

Details Technical Service Manual

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1. General information

1.1 Sprayboom overview

Boomtype	Lenght	Folding	Material	Sprayer type
HOSA	12-15 mtr.	3 part folded	Aluminium	iXter
HC small	18-21 mtr.	4 part folded (18 mtr 3 part)	Steel	iXter Ikarus S
HC big	24-30 mtr.	4 or 5 part folded	Steel	iXter Ikarus S
HSS small	18-24 mtr.	2 part folded	Steel	iXtrack Ikarus S
HSS big	27-30 mtr.	2 part folded	Steel	iXtrack
HSS Small	27-30 mtr.	3 part folded	Steel	iXtrack
HSS big	32-40 mtr.	3 part folded	Steel	iXtrack
HSA	21-33 mtr.	2 part folded	Aluminium	iXtrack
HBWP	33-45 mtr	3 part folded	Steel	iXtrack

1. General information

1.2 Sprayer lines

Stainless steel spray lines

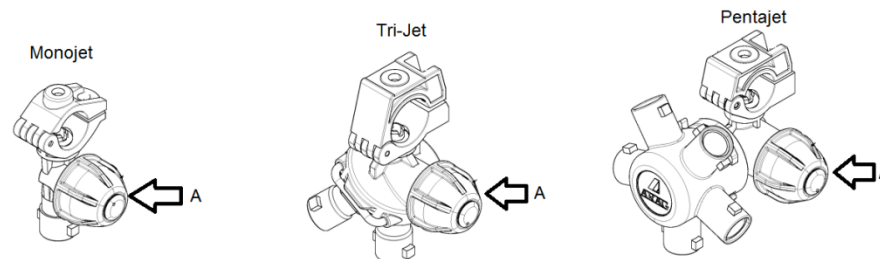
All spray booms are equipped stainless steel spray lines inside the booms. Depending on the sections there are different lengths. The diameter of the stainless steel spray line is 22 mm.

1.3 Springs and shock absorbers

Check for the settings of the springs and shock absorbers the **'TSM Middle frame settings'**

1.4 Nozzle holders

From factory there are 3 different nozzle holders available. All nozzle holders are equipped with an filter. The filter is placed behind the cap (a)



	Partnumber	Number of nozzles	Part number repair set
Monojet	RG00060734	1 nozzle	VNB3675878
Tri-Jet	RG00060735	3 nozzles	VNB3676178
Pentajet	RG00060736	5 nozzles	VNB3676378

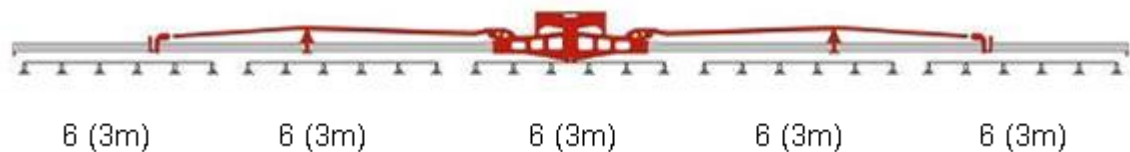
2. HOSA

2.1 General information

- Working width : 12 or 15 mtr.
- 3 part folded
- Aluminium boom
- Only available on iXter
- One side spraying (optional)
- 2,5 mtr. transport width
- Hydraulic locking for pendulum system is standard



2.2 Sections

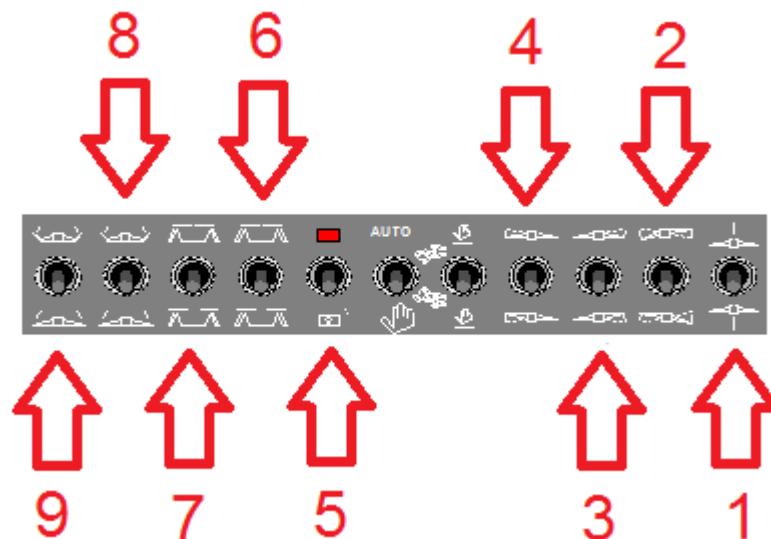


Standard the HOSA sprayer-boom can only be equipped with 5 sections (5 X 3 mtr or 4 X 3 mtr and 2 X 1,5 mtr)

2. HOSA

2.3 Hydraulic packages

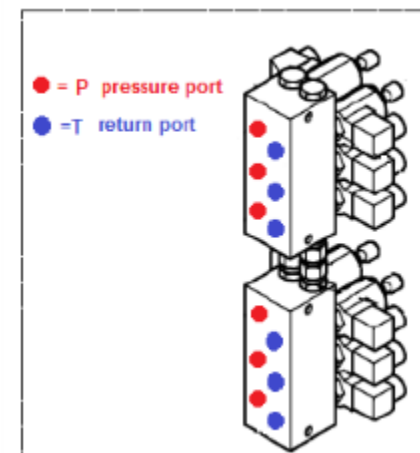
<i>Machine</i>	<i>Boom</i>	<i>Hydro pack</i>	<i>Functionality</i>	<i>Outputs needed</i>
iXter	HOSA 15	Basic 1	Locking(5) + Folding complete(6)	2
iXter	HOSA 15	Basic 2	Locking(5) + Folding complete(6) + Slope correction(2)	3
iXter	HOSA 15	Basic 3	Locking(5)+ folding L (6)+ Folding R(7) + slope correction(2)	4
iXter	HOSA 15	Comfort 3	Oil circulation; Lift(1) + Locking(5) + folding L (6)+ Folding R(7) + slope correction(2)	5



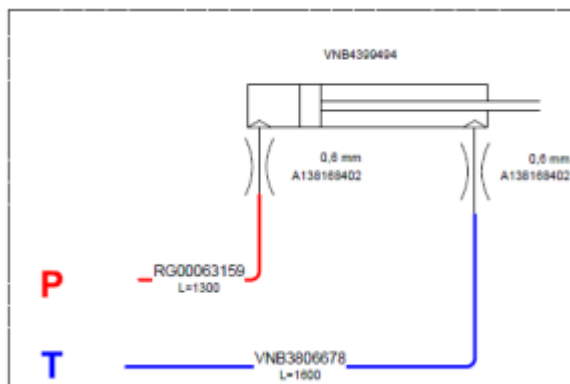
2. HOSA

2.4 Hydraulic schedule

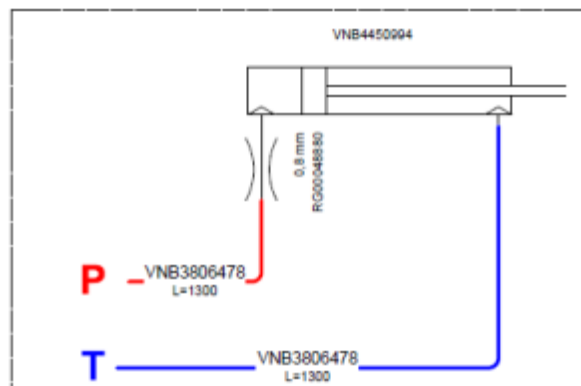
- Folding out – pressure on T
- Folding in – pressure on P
- The restrictors in the folding cylinders are mounted inside the cylinder since 01-04-2013 (before the restrictors were mounted between the P&T hose and the cylinder)



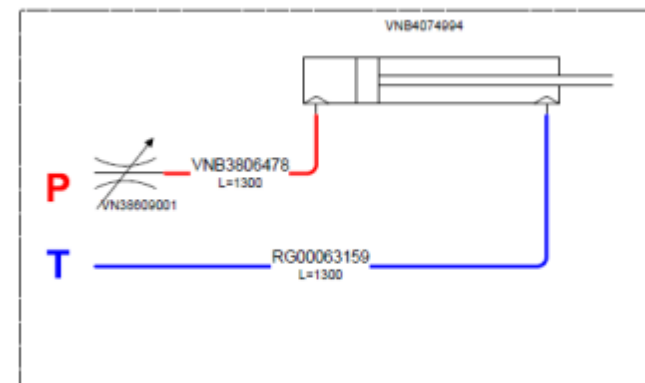
Folding left and right independent



Locking

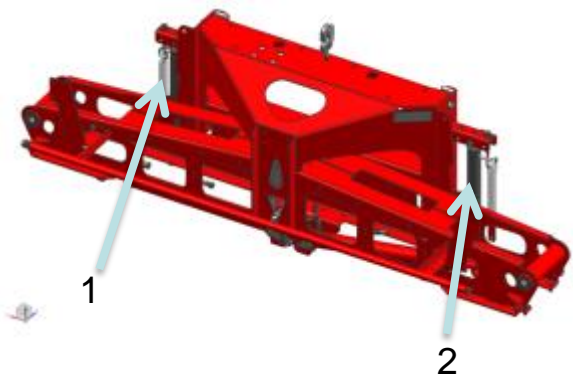


Slope correction



2. HOSA

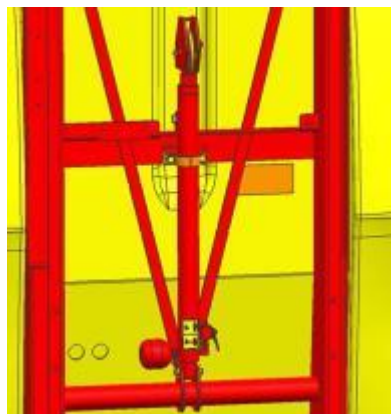
2.5 Middle frame



The middle frame of the HOSA boom is always in *hilly position*.

Check for all settings regarding balancing
‘TSM Middle frame settings - sprayers’

2.6 Vertical damping



The boom has vertical damping by the accumulator in the main lift cylinder.

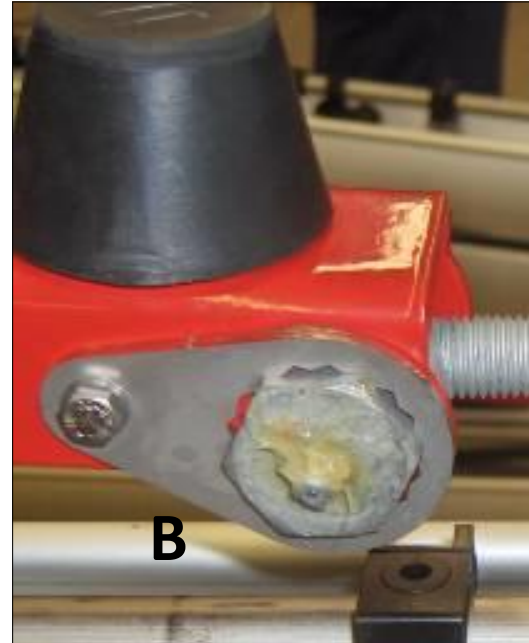
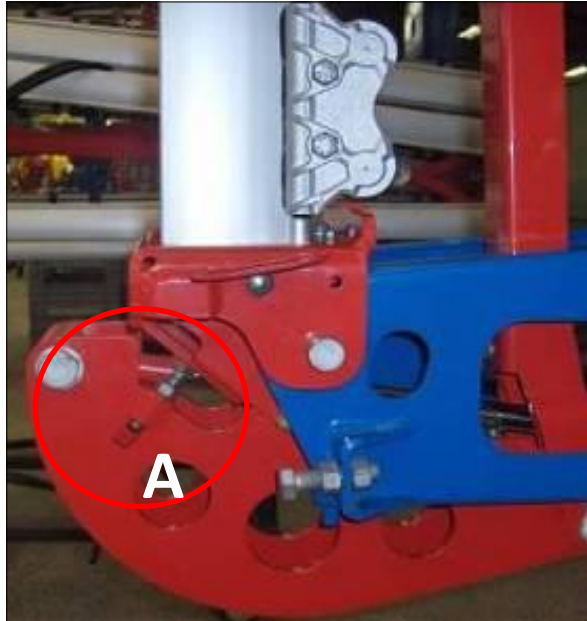
The accumulator is filled with 30 Bar

2. HOSA

2.7 Boom adjustments



- 1) Adjust the first boom parts horizontal with the **detail 1** screw.
- 2) Adjust the second boom part horizontal with the **detail 2** screw
- 3) Adjust the third boom part horizontal with the **detail 3** screw.

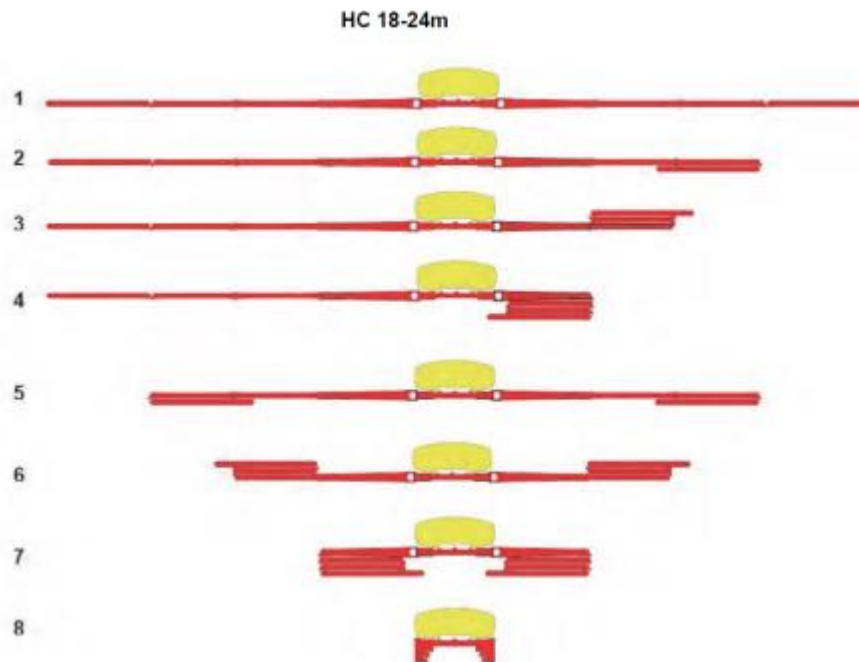


- 4) Fold the first boom part completely in till it is standing vertical. Screw at this position the adjustment bolt A to the plate and fixate it
- 5) - Fold the boom out and fold the third and second boom part in again.
 - Check the tension on this point. (the tension must be +/- 5kg)
 - When there is not enough tension adjust this with screw B.
 - After adjusting check and repeat step 3 again

3. HC

3.1 General information

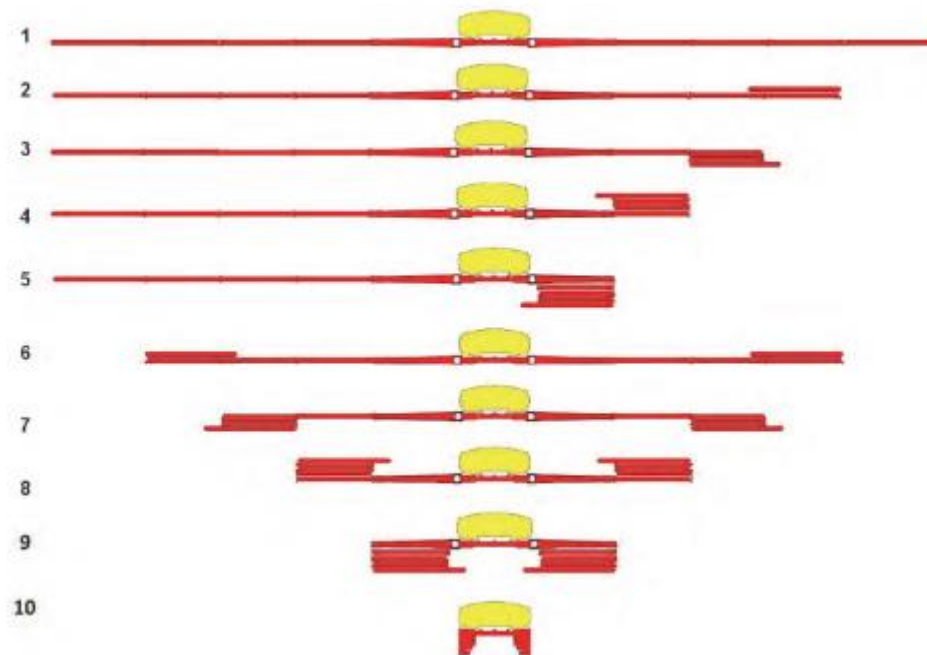
- Working width : 18 -30 mtr
 - HC small 18/20/21 mtr
 - HC big 24/27/28/30 mtr
- 3-5 part folded
- Steel boom
- Available on iXter an Ikarus S
- One side spraying (optional)
- 2,5 mtr. transport width



<i>HC 18-24 mtr.</i>	HC 18 m.	HC 20 m.	HC 21 m.	HC 24 m.
1	18 m.	20 m.	21 m.	24 m.
2	-	18 m.	18,5 m.	21 m.
3	15 m.	16 m.	16,5 m.	18,5 m.
4	12,5 m.	14 m.	14,5 m.	16 m.
5	12 m.	16 m.	16 m.	18m.
6	-	12 m.	12 m.	13 m.
7	8 m.	8 m.	8 m.	8 m.
8	2,5 m.	2,5 m.	2,5 m.	2,5 m.

3. HC

HC 27-30m

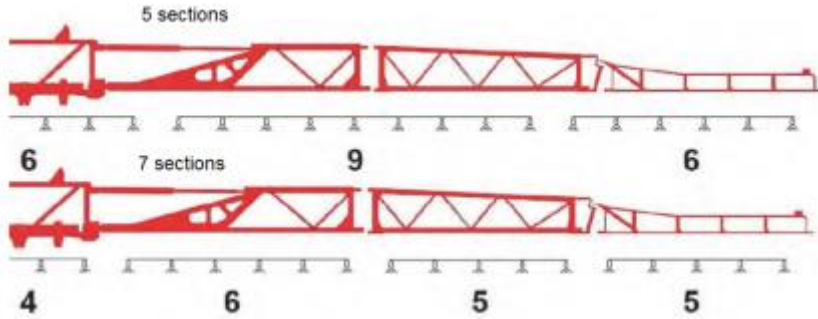


<i>HC 27-30 m.</i>	HC 27 m.	HC 28 m.	HC 30 m.
1	27 m.	28 m.	30 m.
2	25 m.	26 m.	27 m.
3	22,5 m.	23 m.	24 m.
4	20 m.	20,5 m.	21,5 m.
5	17,5 m.	18 m.	19 m.
6	23 m.	24 m.	24 m.
7	18 m.	18 m.	18 m.
8	13 m.	13 m.	13 m.
9	8 m.	8 m.	8 m.
10	2,5 m.	2,5 m.	2,5 m.

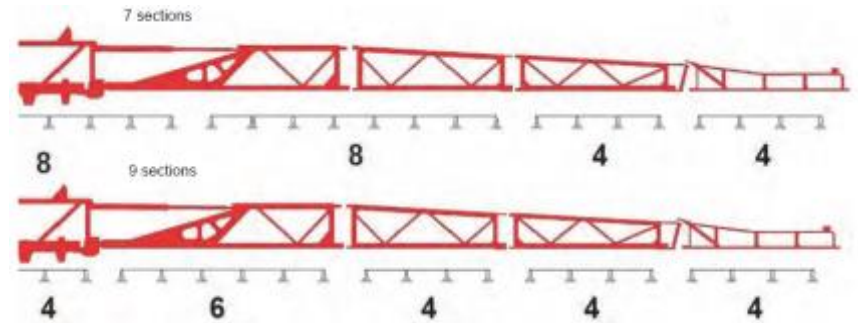
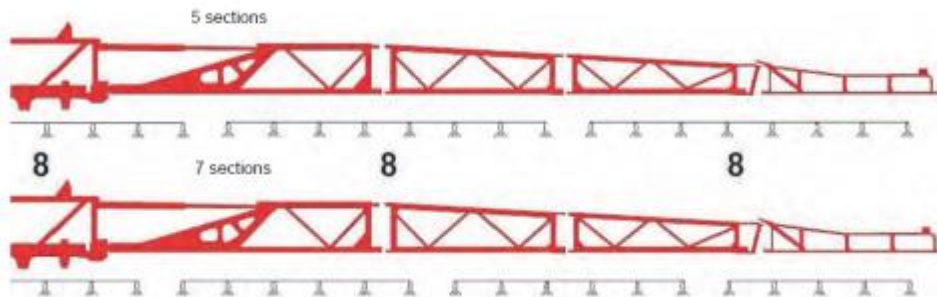
3. HC

3.2 Sections

- 18 m.

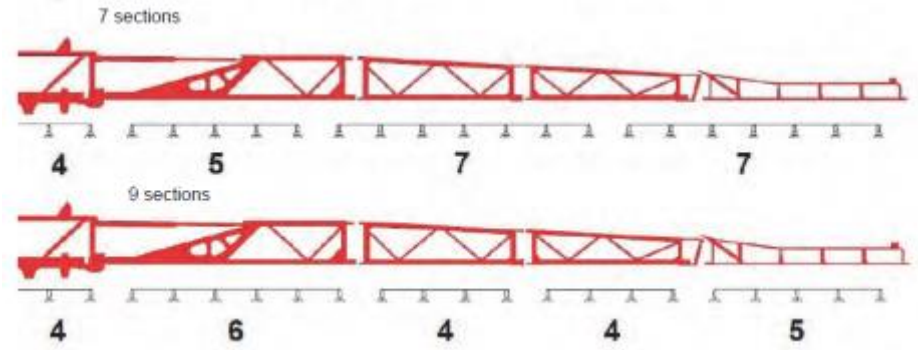
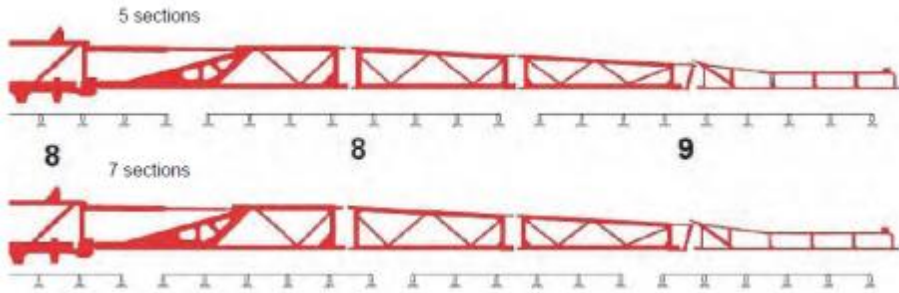


- 20 m.

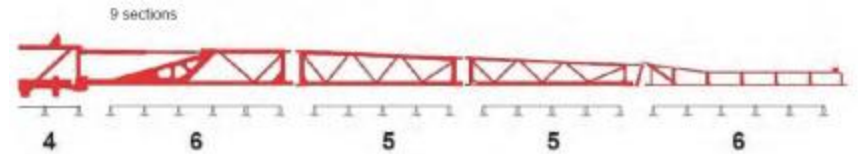
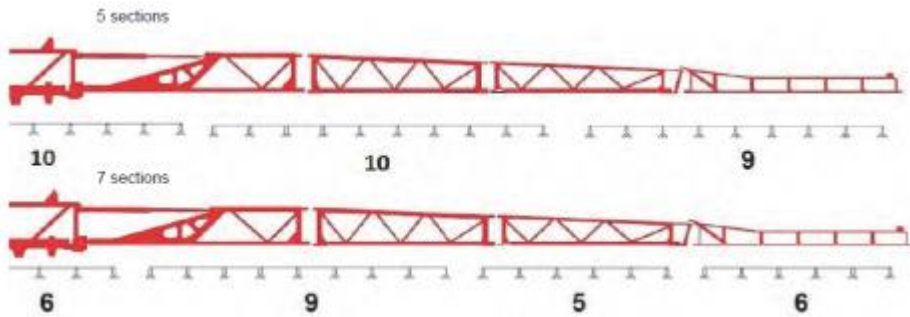


3. HC

- 21 m.

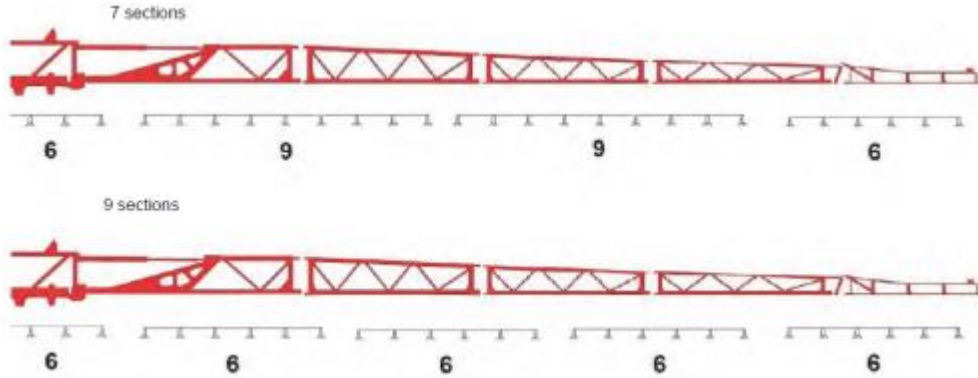


- 24 m.

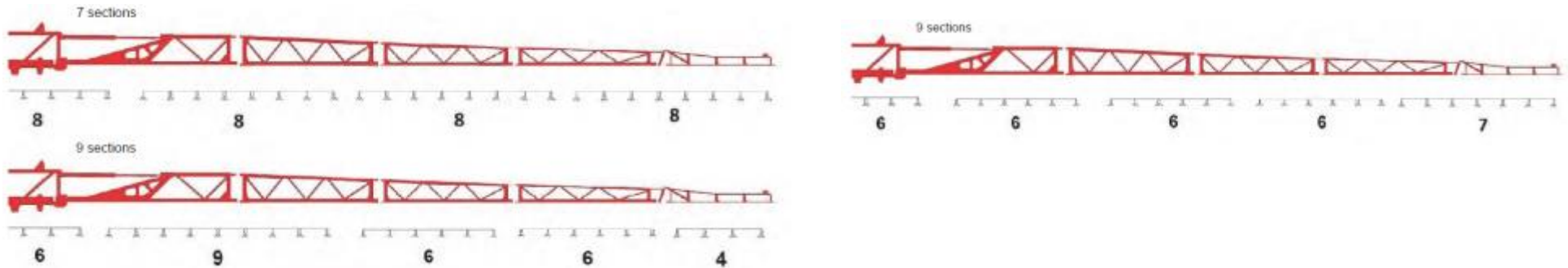


3. HC

- 27 m.

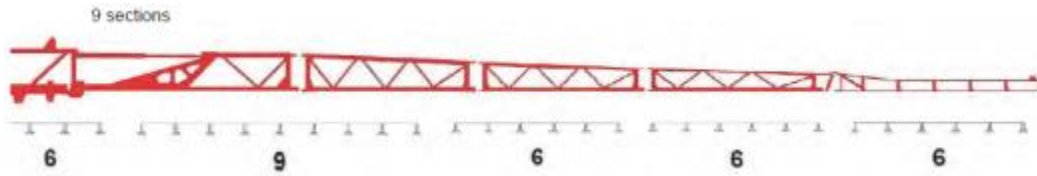


- 28 m.



3. HC

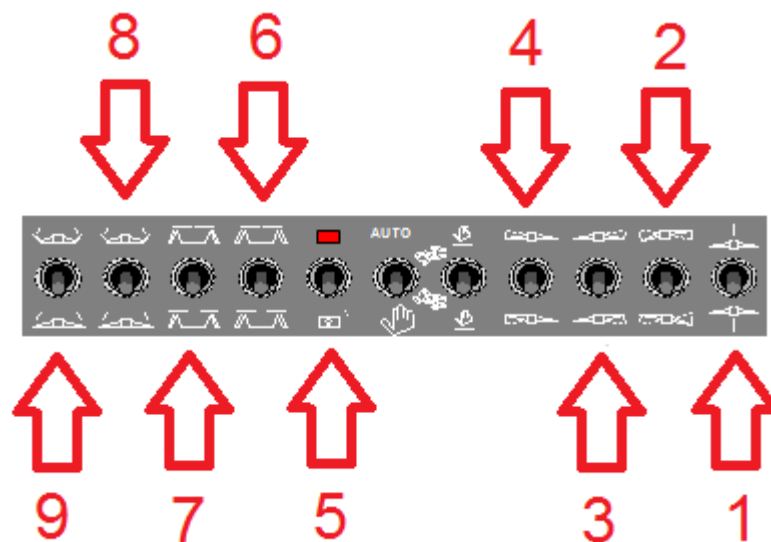
- 30 m.



3. HC

3.3 Hydraulic packages

<i>Machine</i>	<i>Boom</i>	<i>Hydro pack</i>	<i>Functionality</i>	<i>Outputs needed</i>
iXter	HC 18-24	Basic 1	Slope correction (2) + locking (5) + folding (3)	3
iXter	HC 18-24	Comfort 1	Oil circulation; lift (1) + slope correction (2) + locking (5) + folding (3+4)	5
iXter + Ikarus S	HC (all)	Comfort 2	Oil circulation; lift (1) + slope correction (2) + locking (5) + folding (3+4) + a-sym. Folding (6+7)	7

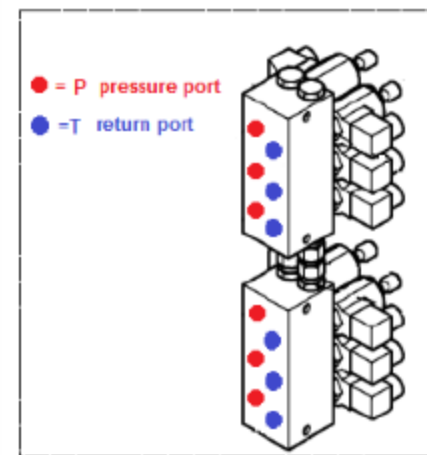
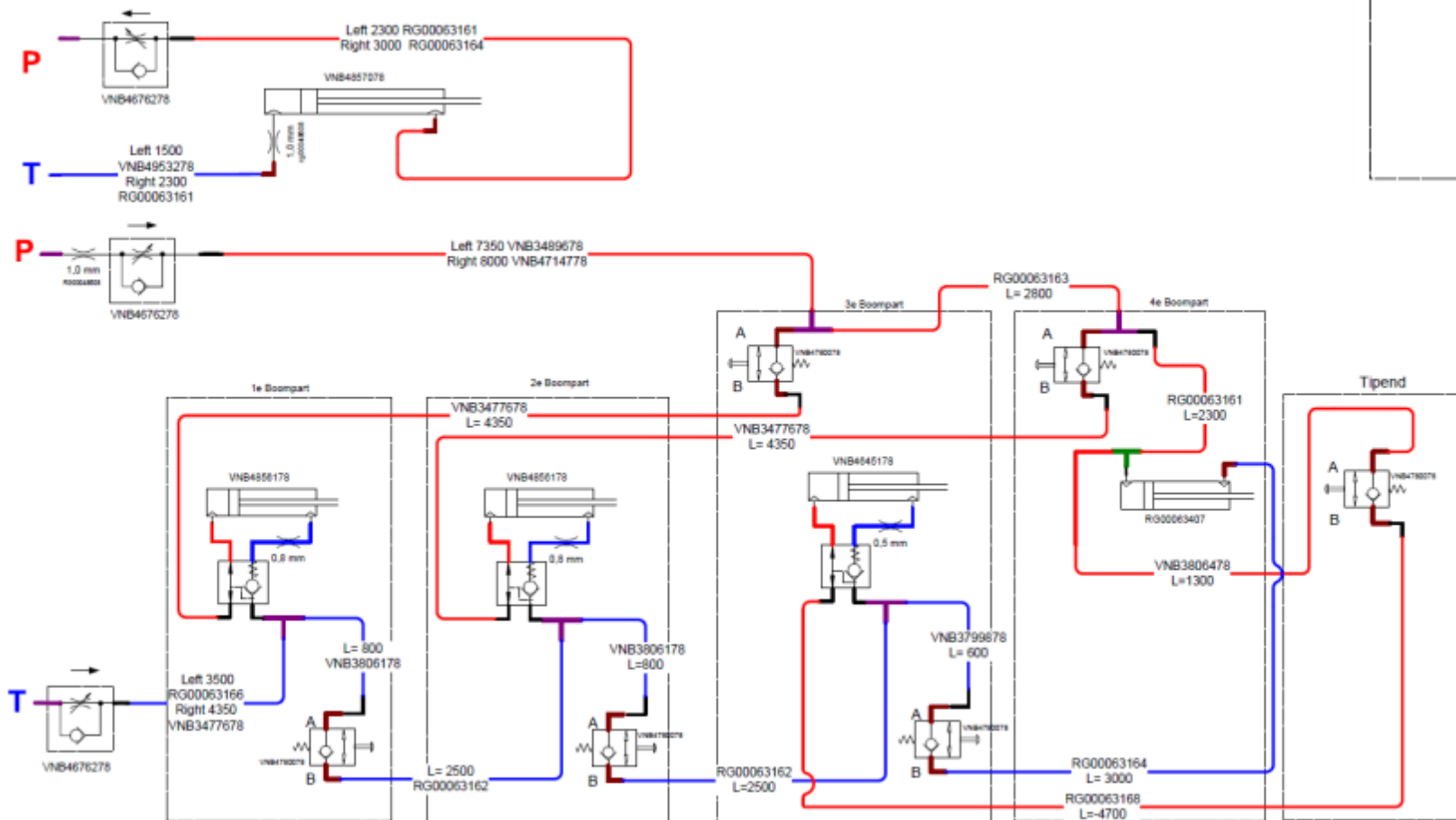


3. HC

3.4 Hydraulic schedules

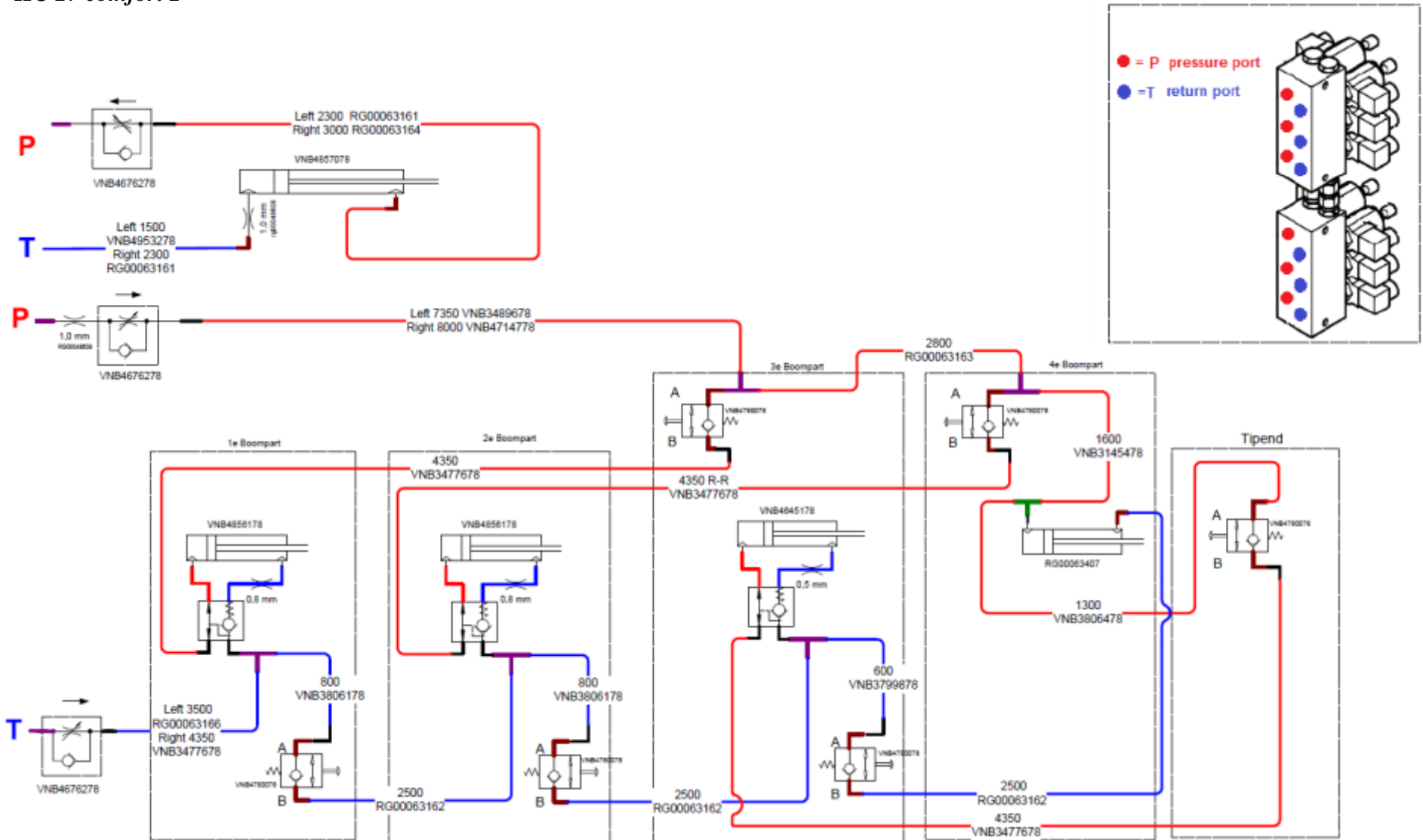
- Folding out – pressure on T
- Folding in – pressure on P

HC 28-30 comfort 2



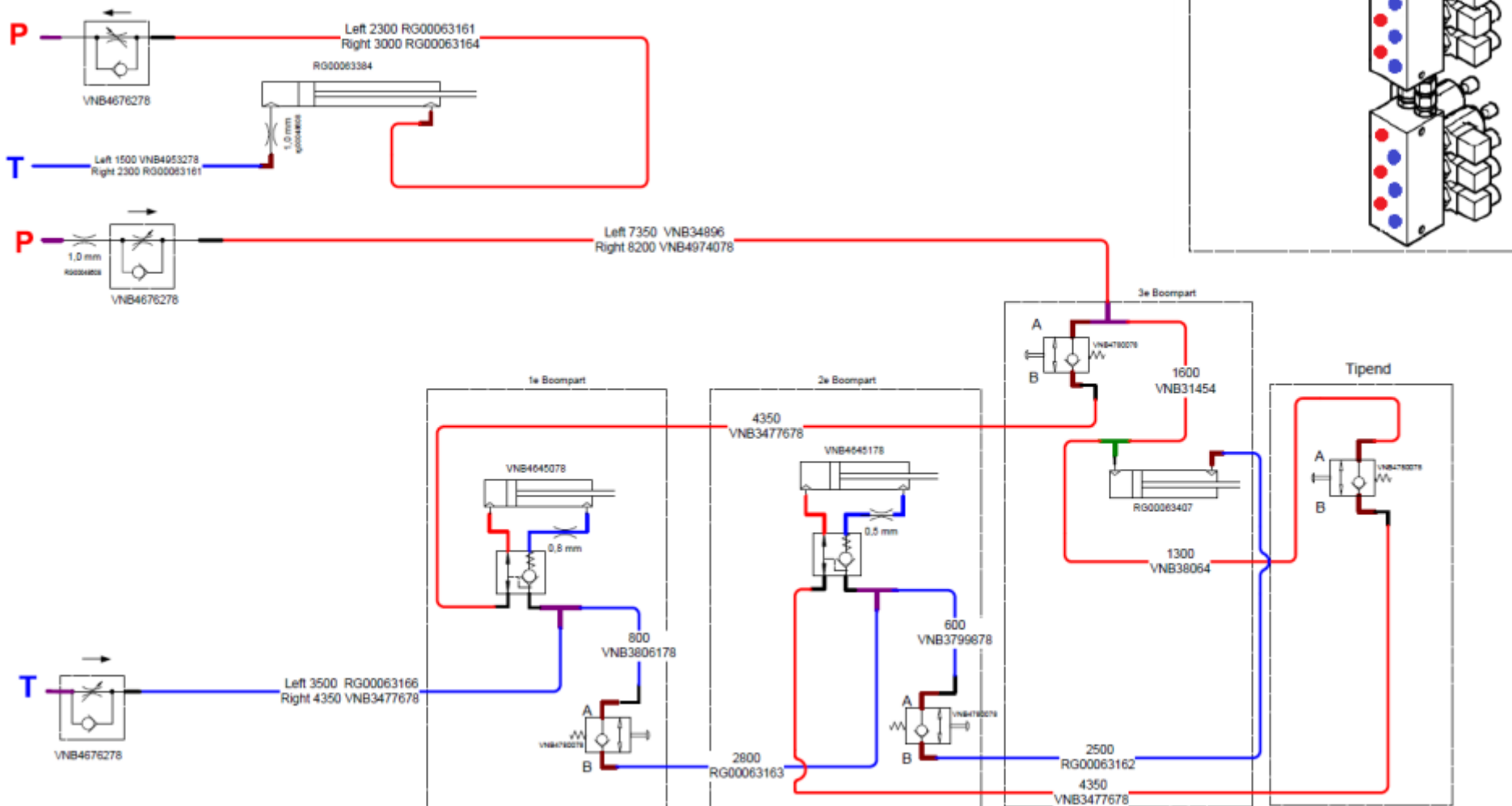
3. HC

HC 27 comfort 2



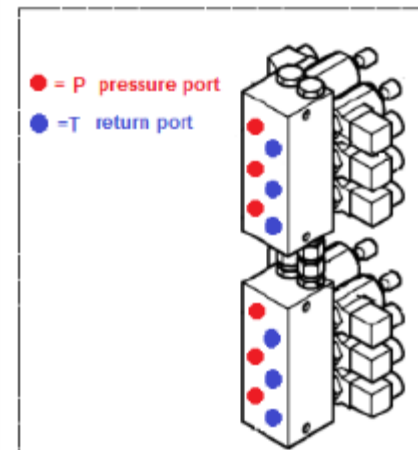
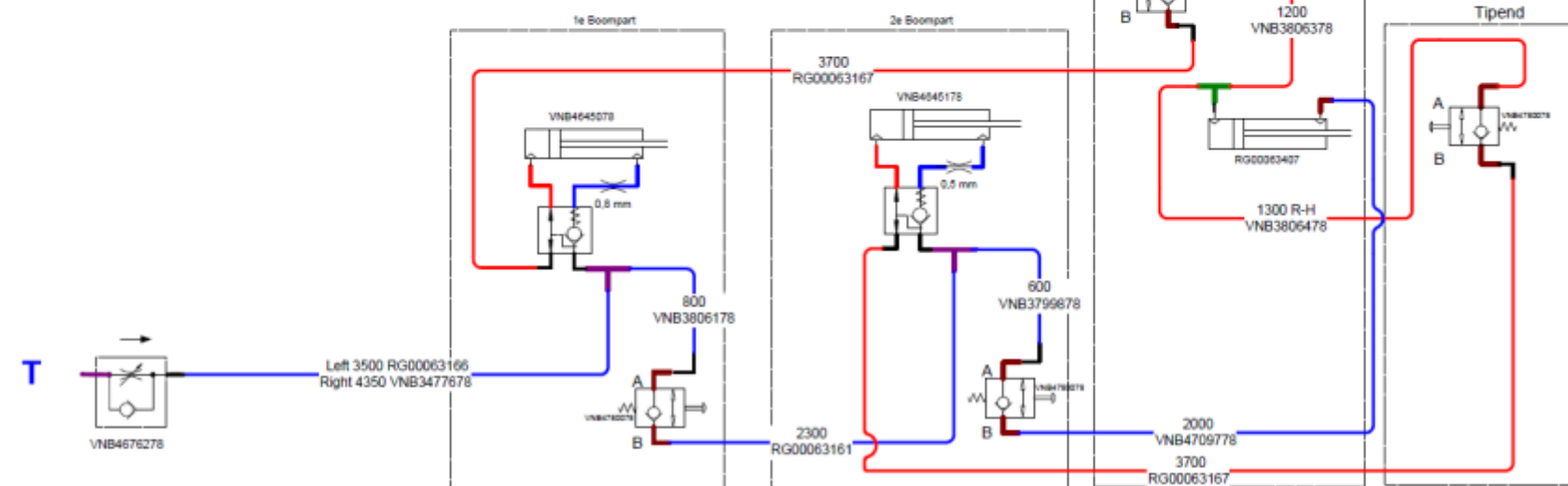
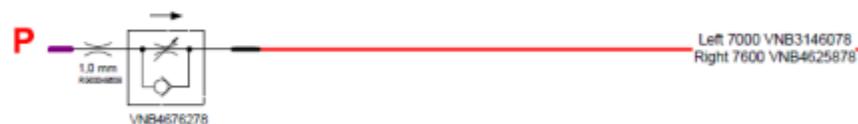
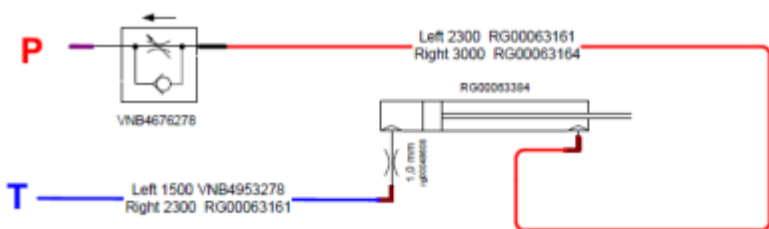
3. HC

HC 24 comfort 2



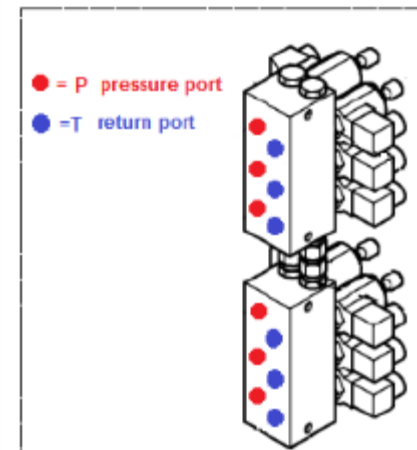
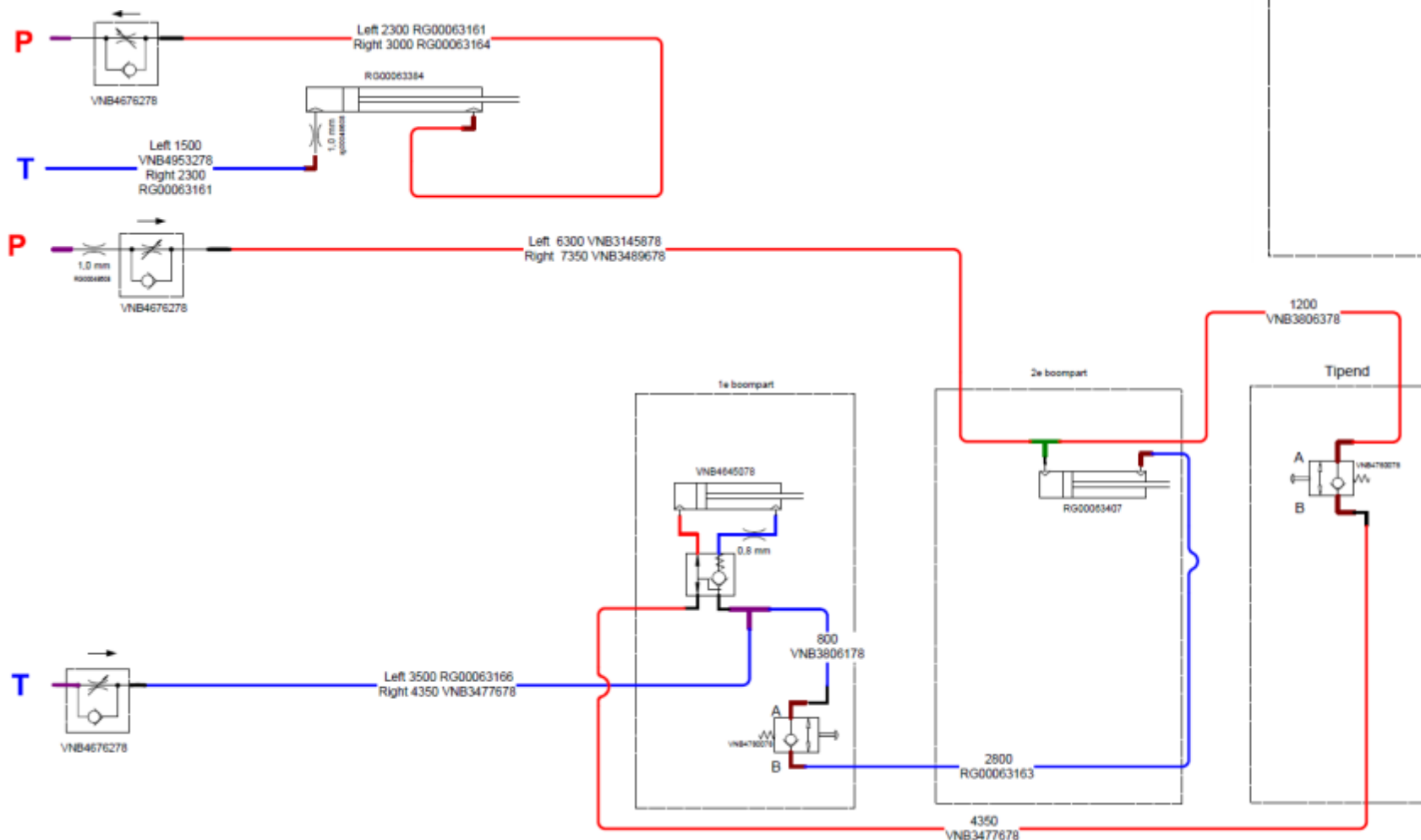
3. HC

HC 20+21 comfort 2



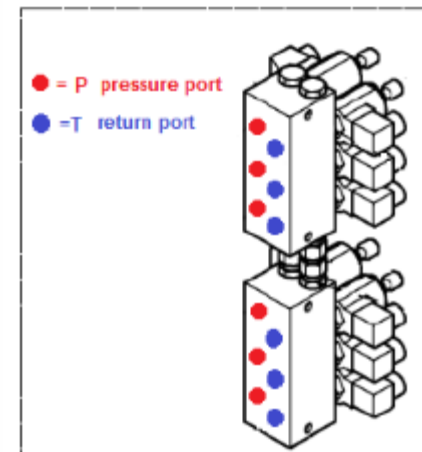
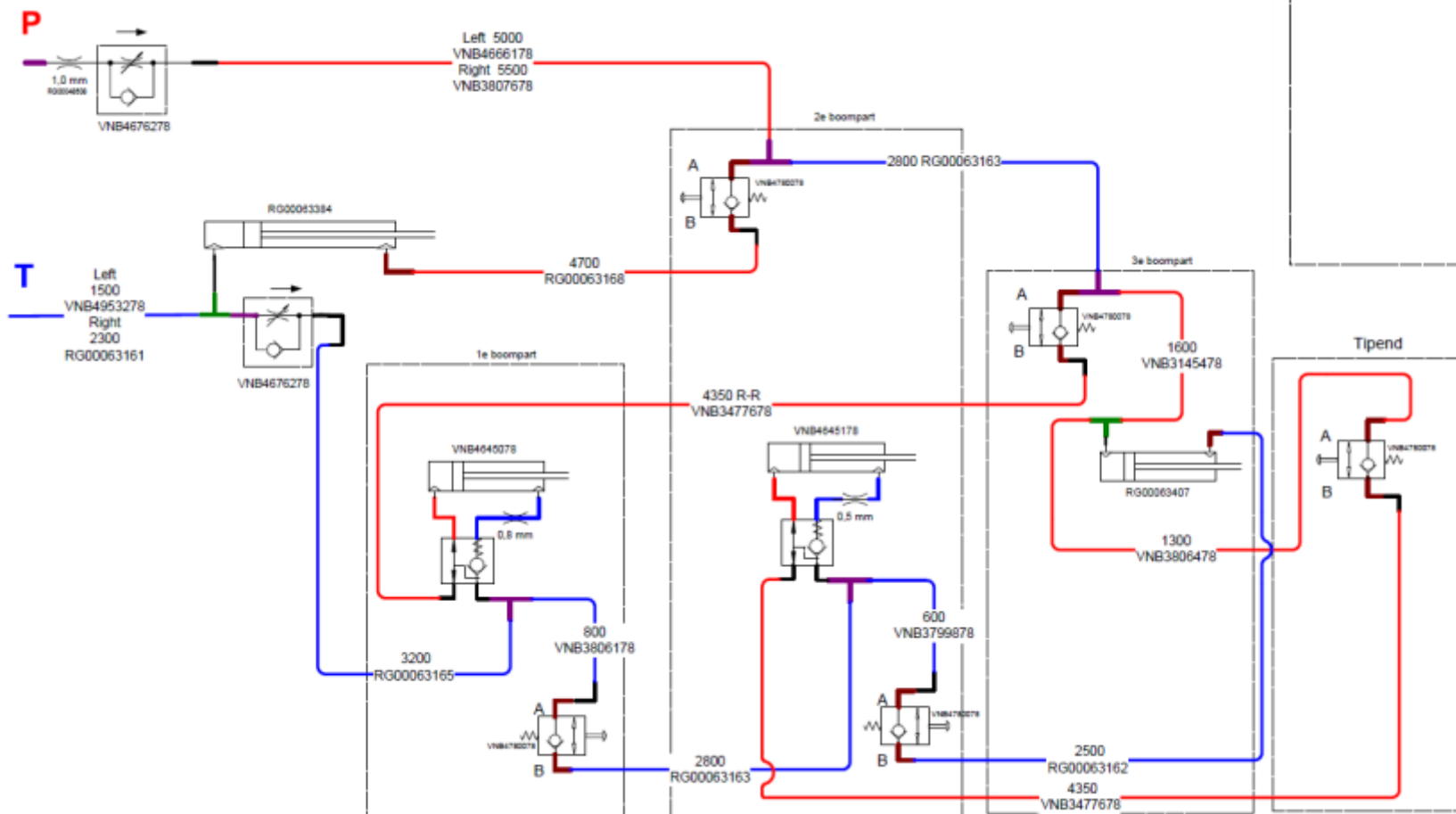
3. HC

HC 18 comfort 2



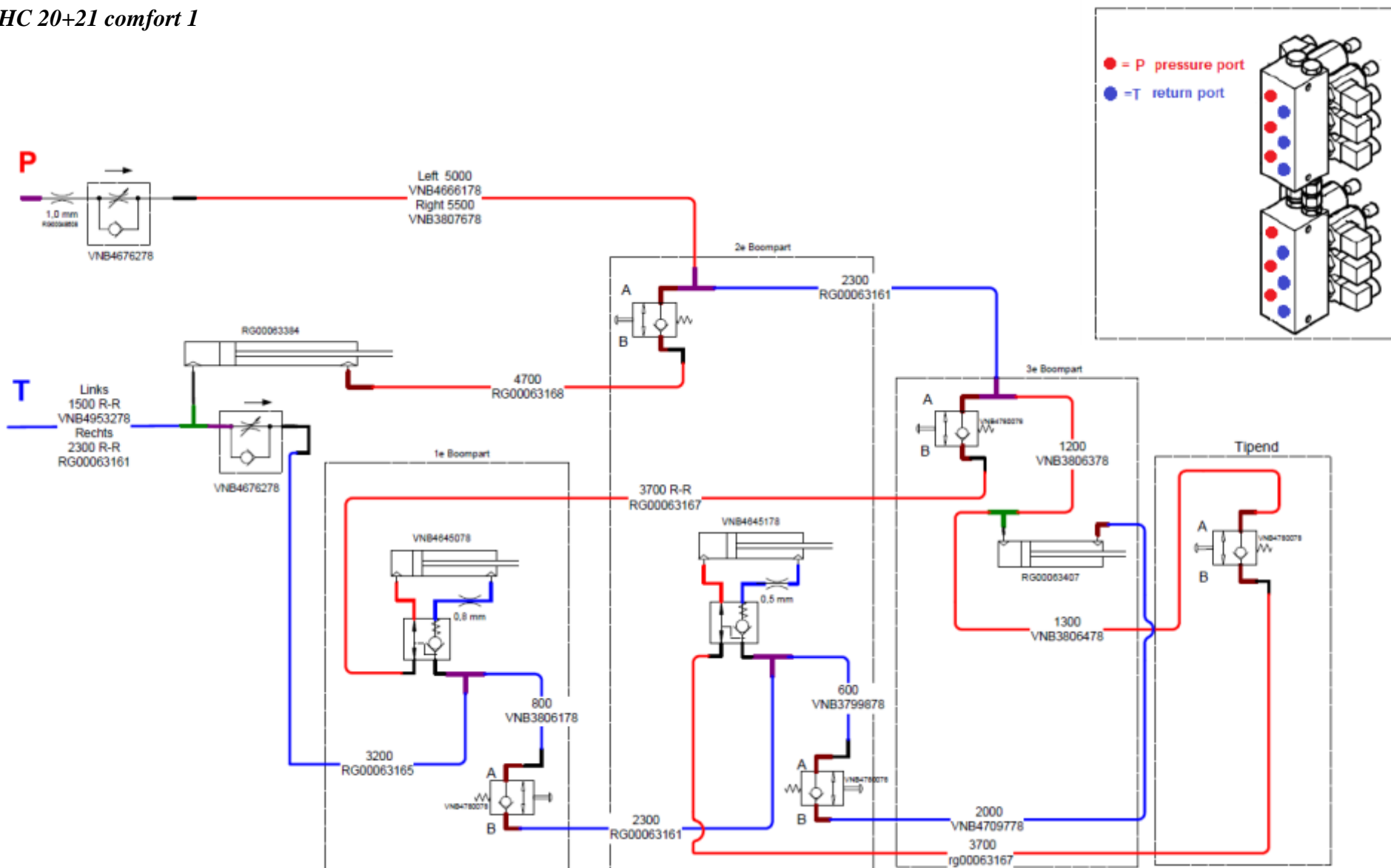
3. HC

HC 24 comfort 1



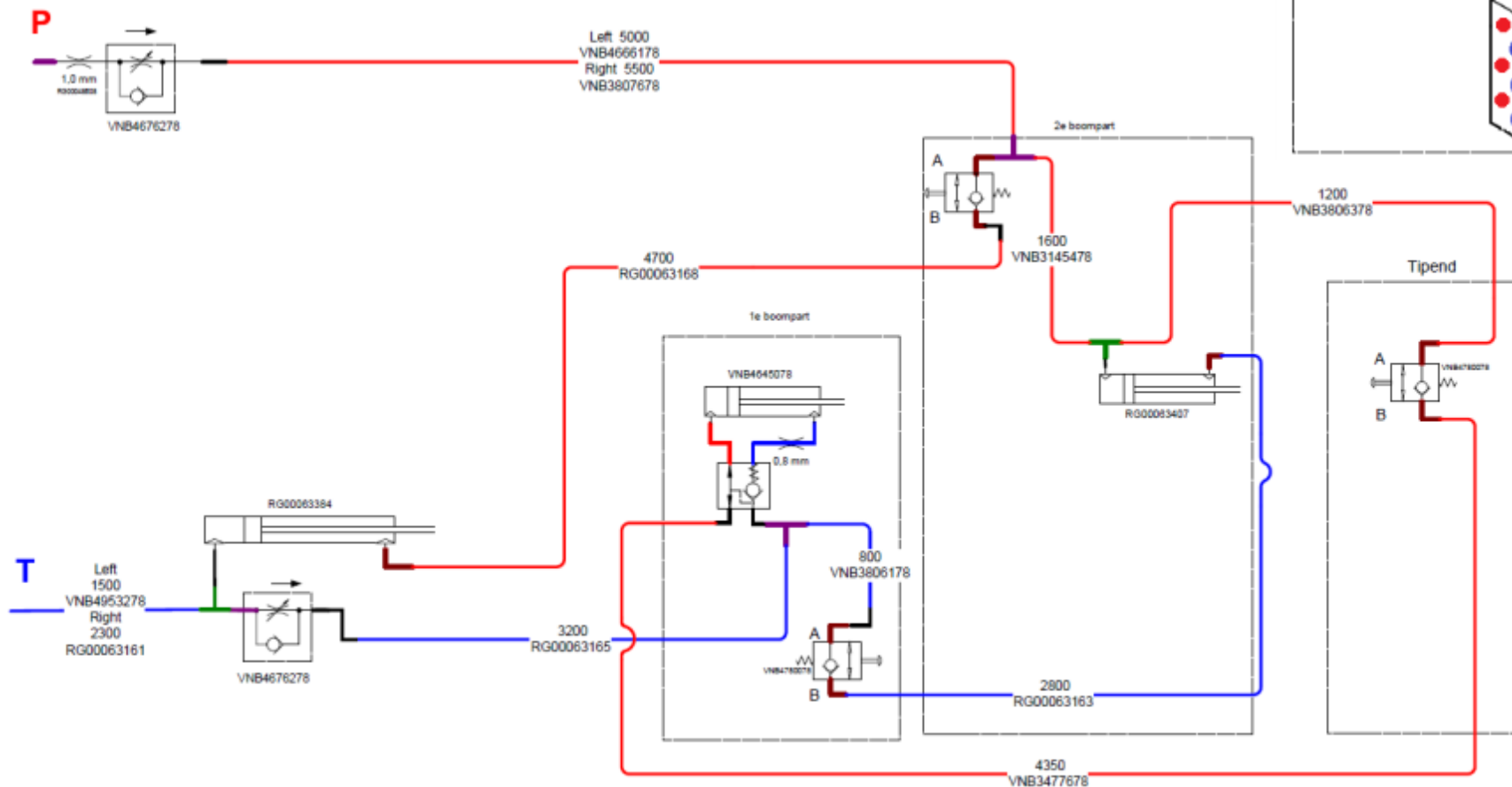
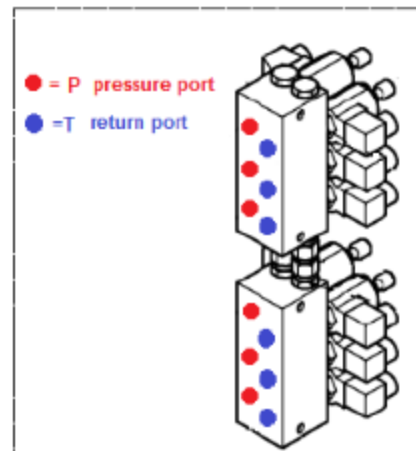
3. HC

HC 20+21 comfort 1



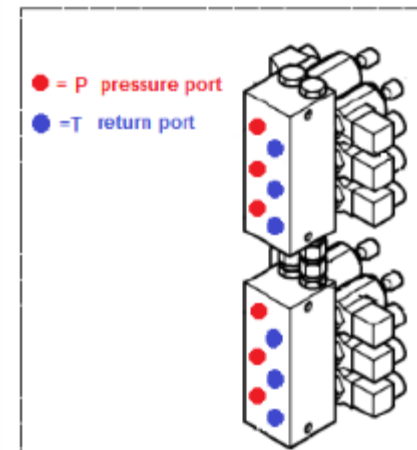
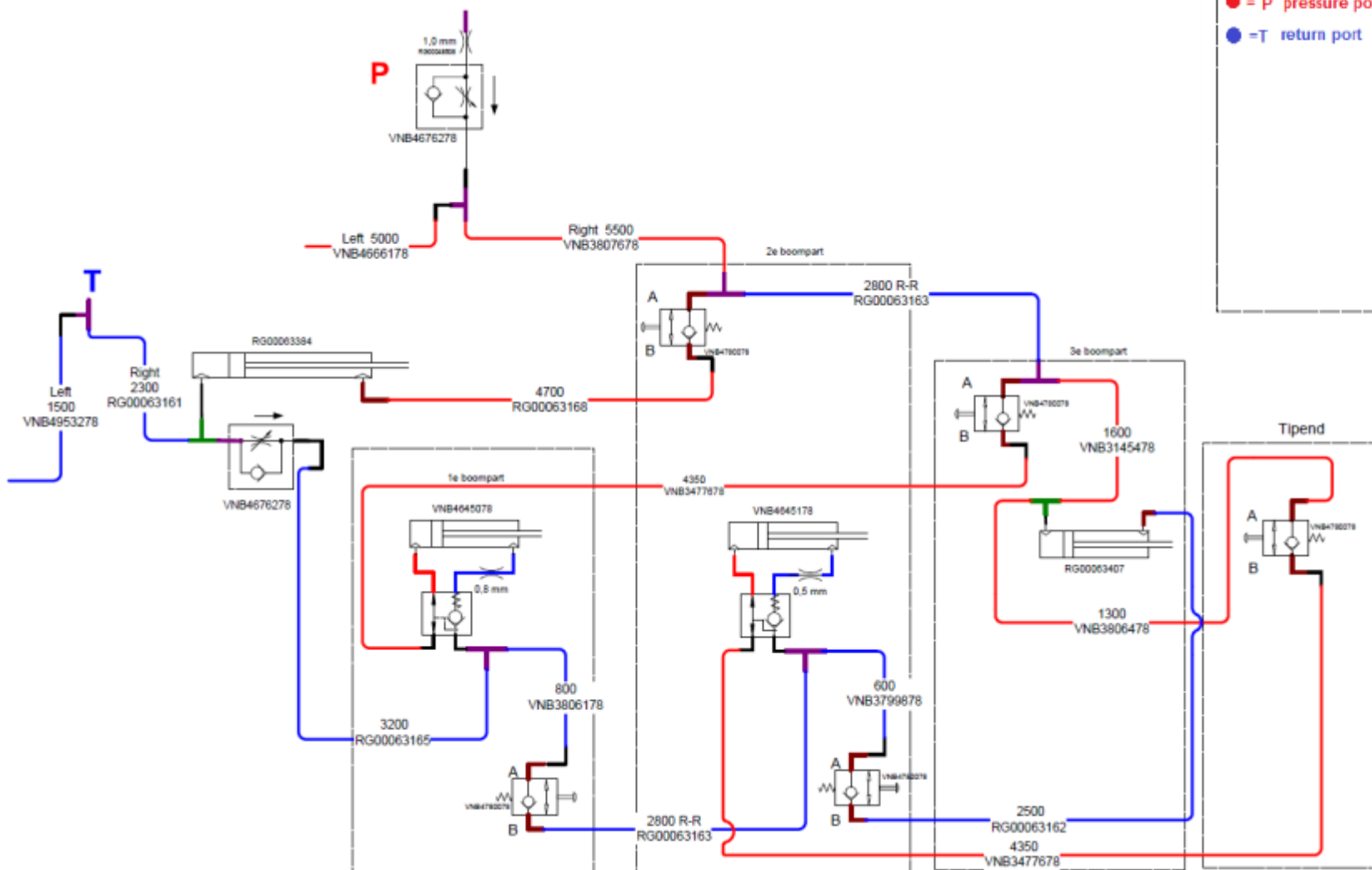
3. HC

HC 18 comfort 1



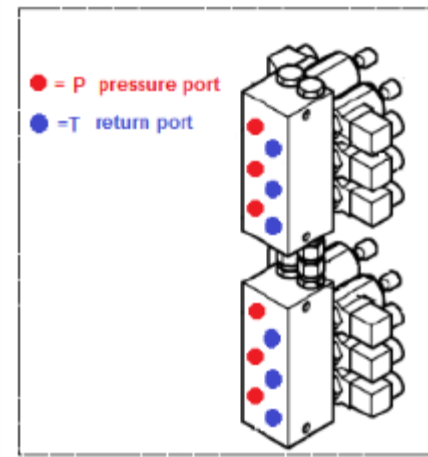
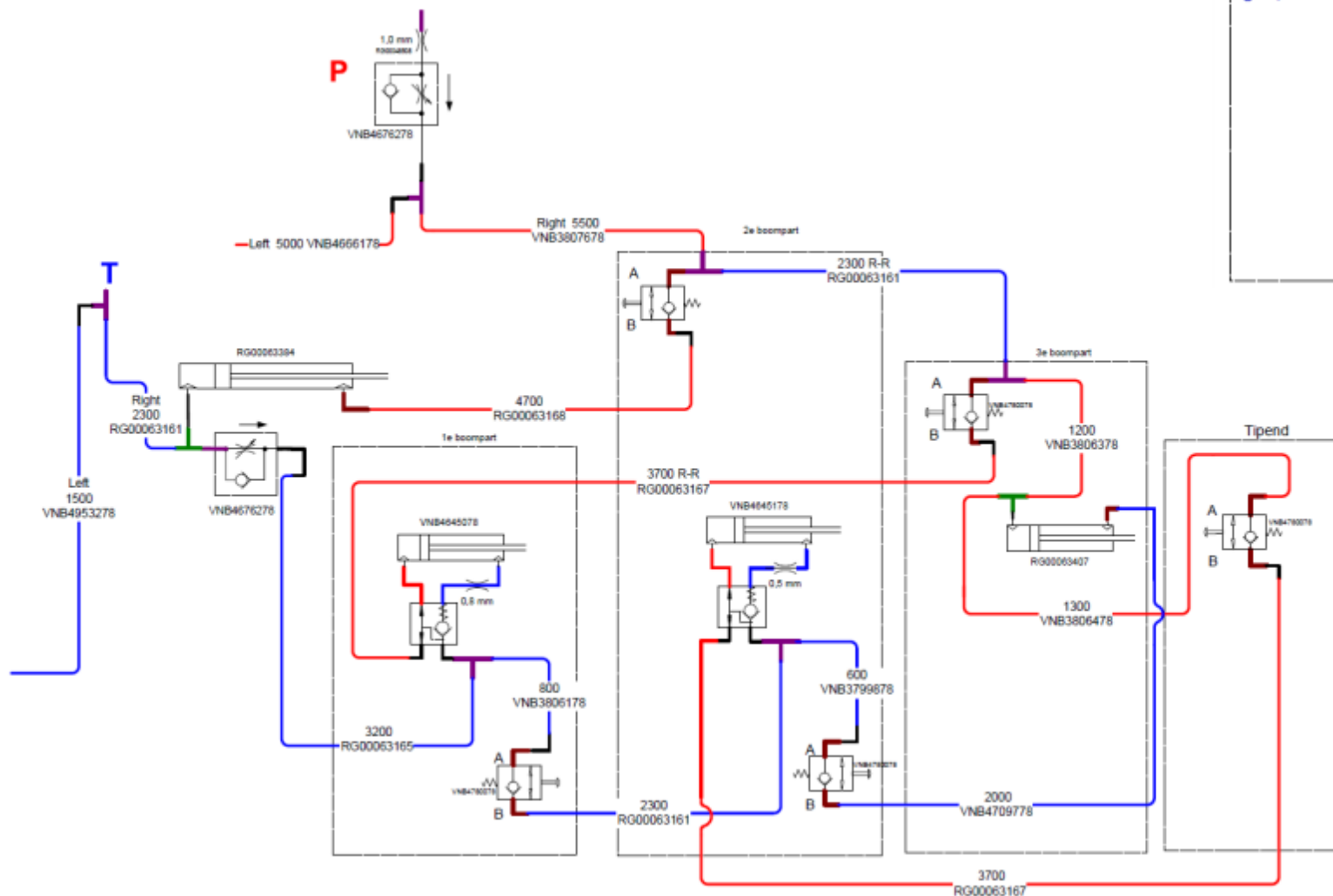
3. HC

HC 24 hydro basic



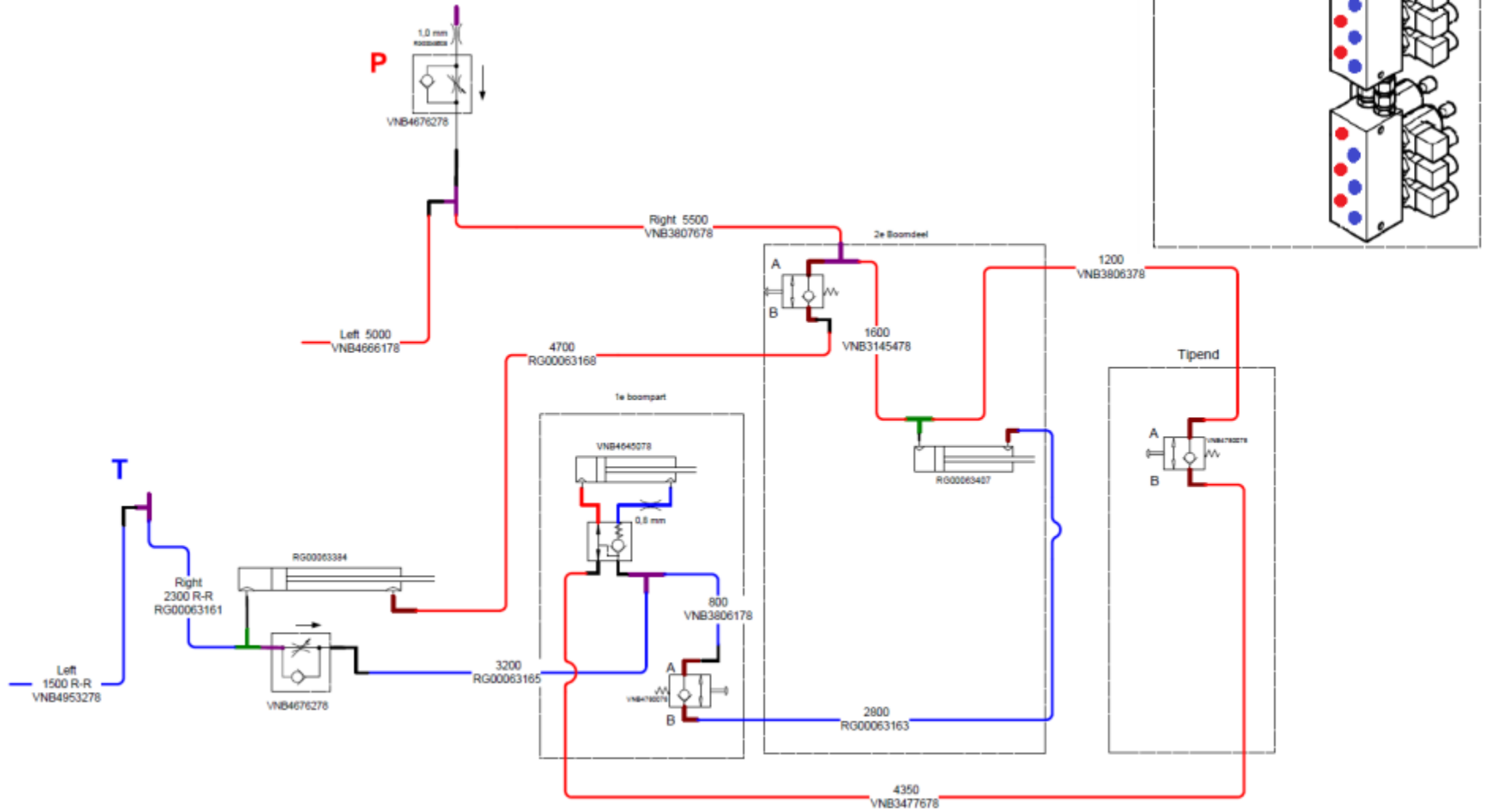
3. HC

HC 20+21 hydro basic



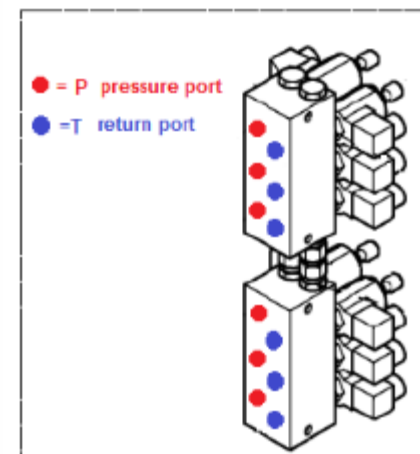
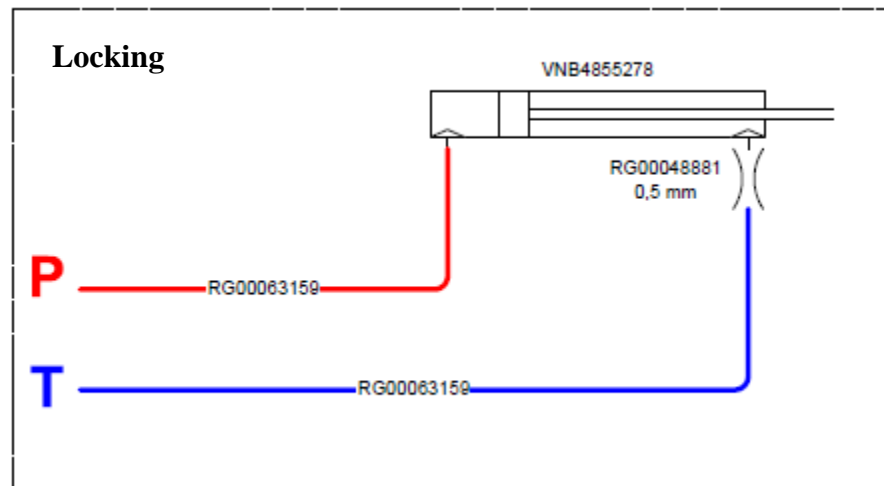
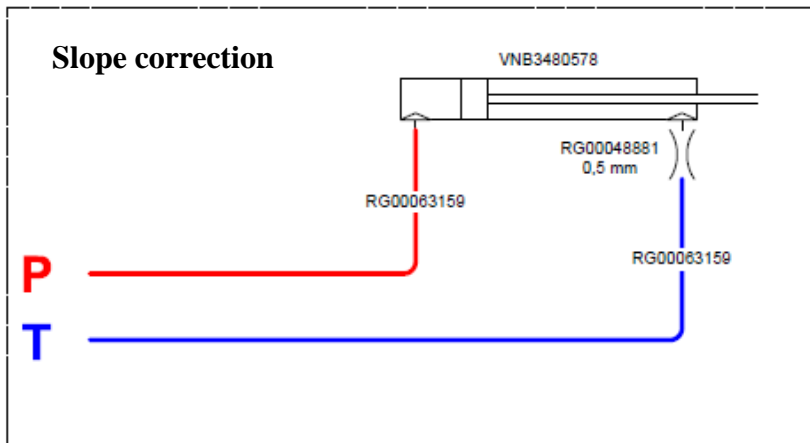
3. HC

HC 18 hydro basic



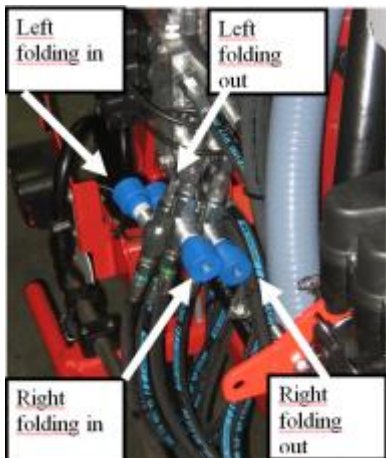
3. HC

HC 18 -30



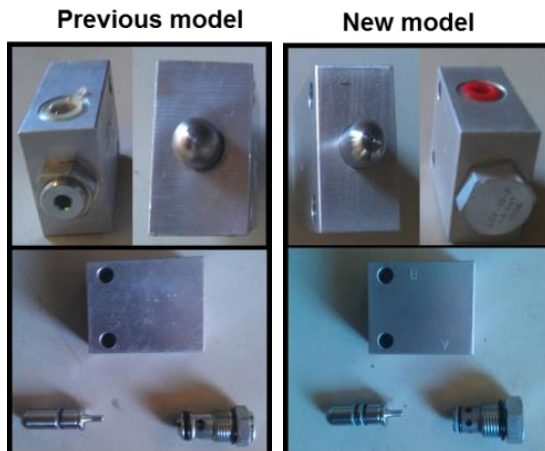
3. HC

3.5 Folding speed



The speed of folding in and out can be regulated by adjustable restrictors. These adjustable restrictors are only mounted in combination with an comfort 2 hydraulic package

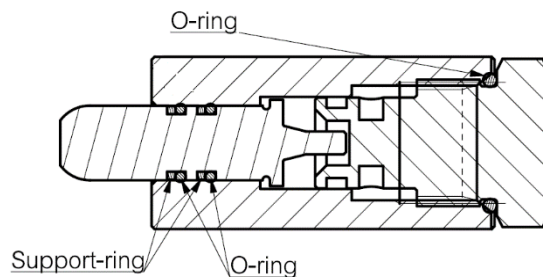
3.6 Switching valves



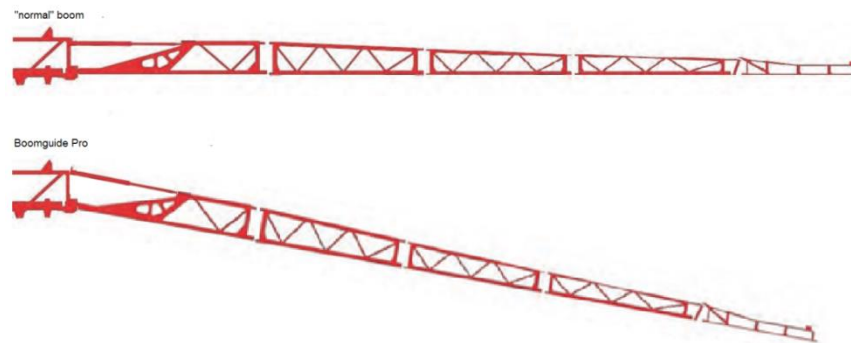
Sealkit available for sequence valves HC booms.

Kit contains all O- and support rings which are mounted inside the valve

Available through Metz



3.7 V.G cylinders

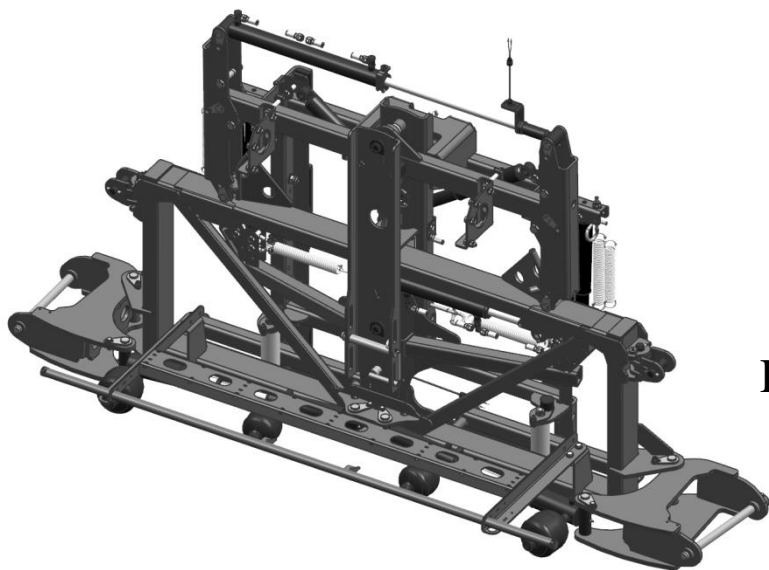
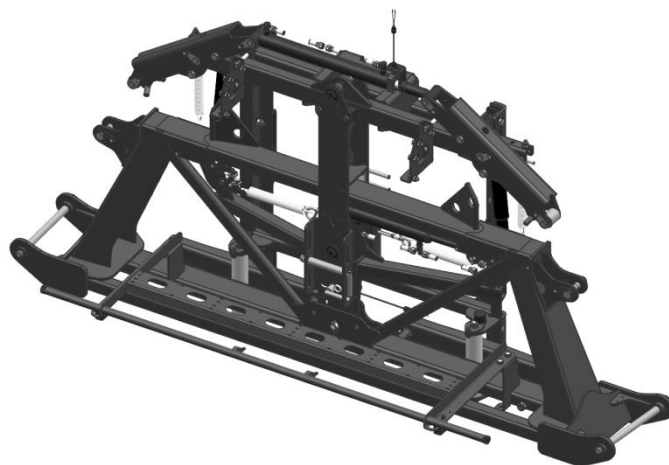


Depending if the sprayer is equipped with an *Boomguide Pro* system the VG cylinders of the spray boom have a different length (different part number). When there is an boomguide pro system mounted the VG cylinders are longer to make it possible that the spray boom can go in a “negative” position.

3. HC

3.8 Middle frame

HC 18-21



HC 24-30

There are differences between the HC 18-21 and HC 24-30 middle frame

3.9 Vertical damping



The HC boom 18-21 and 24-30 has vertical damping by the accumulator on the main-lift cylinder.

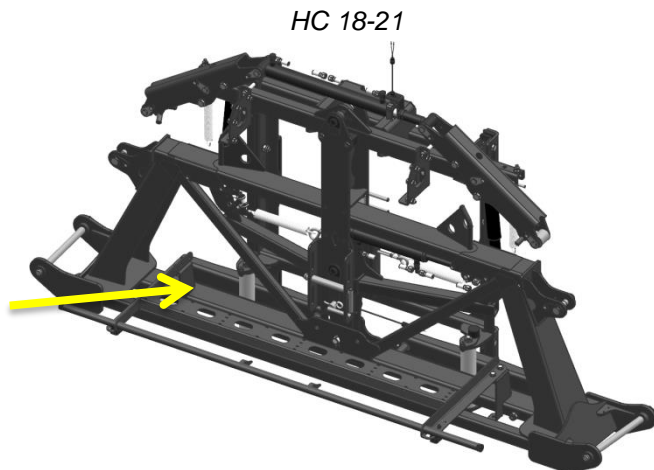
HC 18-21 – 50 Bar pressure on nitrogen side

HC 24-30 – 100 Bar pressure on nitrogen side (since 01-01-2015)

(machines produced before 01-01-2015 has also 50 Bar pressure)

3. HC

3.10 Horizontal damping



HC 18-21

HC 18-21

The horizontal damping of the HC 18-21 boom is done by rubber buffers in the middle frame.

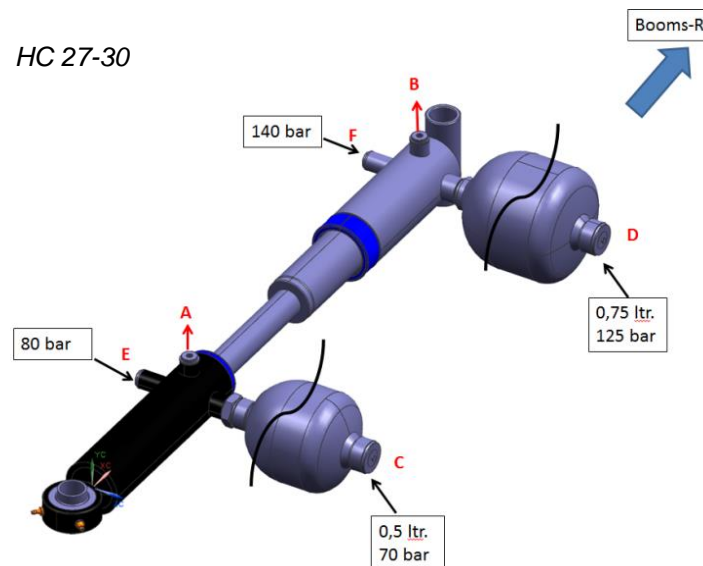
HC 24-30

The horizontal damping of the HC 24-30 boom is done by hydraulic damping cylinders

The damping pressure is set to the right pressure from factory. However the damping pressure in the nitrogen ball can be set/checked.

- Release oil at ports **A** and **B**. (Lock the boomsparts)
- Measure nitrogen pressure at accumulator ports **C** and **D**, this should be 70 and 125 Bar. If the pressure is OK, the accumulator works OK. Refill if necessary.
- Refill the cylinders at ports **E** and **F**, but leave the outlet ports **A** and **B** slightly open. Close the ports **A** and **B** when you are certain that only oil is coming out and no air(bubbles).
- Refill the cylinders with oil at ports **E** and **F** and measure the oil pressure at the same time. Refill until a pressure of 80 bar is reached at port **E** and 140 bar is reached at **F**.

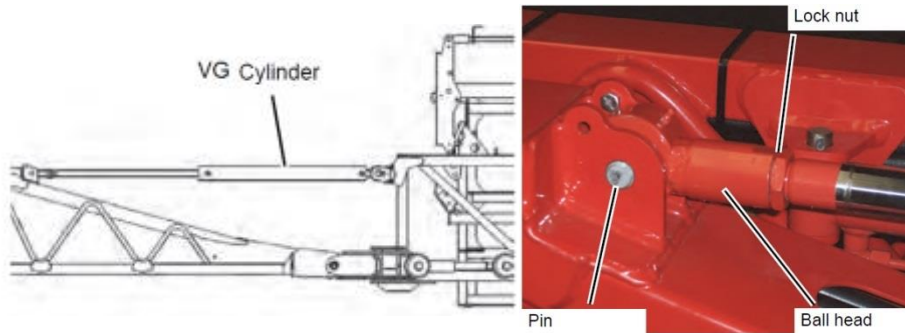
HC 27-30



Check for all settings regarding balancing
'TSM Middle frame settings - sprayers'

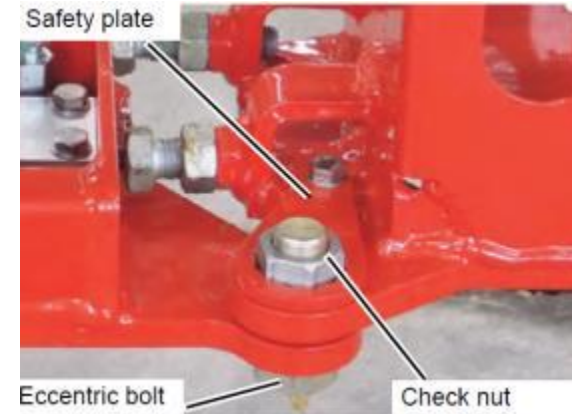
3. HC

3.11 Boom adjustments



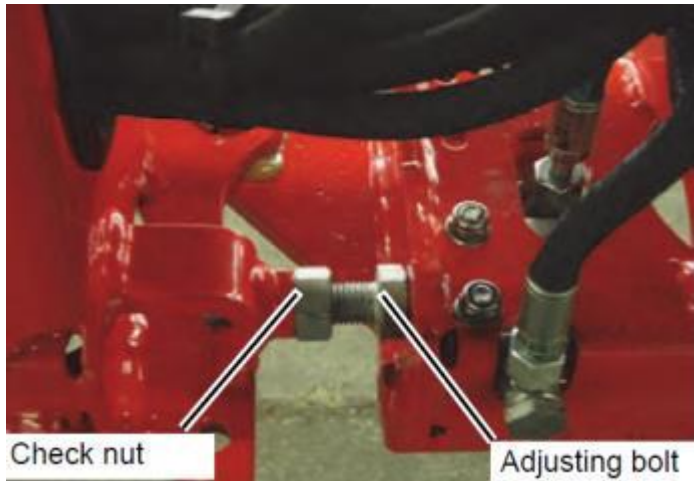
The first boom parts (left and right) can be set horizontal by adjusting the VG cylinders.

- Unfold the spray boom and place it on firm supports.
- Take the pressure off the hydraulic system.
- Loosen the lock nut by a few turns.
- remove the pin from the ball head.
- turn the ball head until the cylinder reaches the desired length.
- put the pin back into the ball head.
- Tighten the lock nut.



The outer side parts can be brought in line horizontally by adjusting the excentre bolts.

- Unscrew the bolt which is holding the safety plate.
- Remove the safety plate.
- Loosen the check nut by a few turns.
- Adjust the eccentric bolt such that the spray parts lie horizontally in one line.
- Fasten the check nut again.
- Place the safety plate back over the check nut.
- Screw the bolt which is holding the safety plate again



The boom can be adjusted vertically with the adjusting bolts in the subprofile.

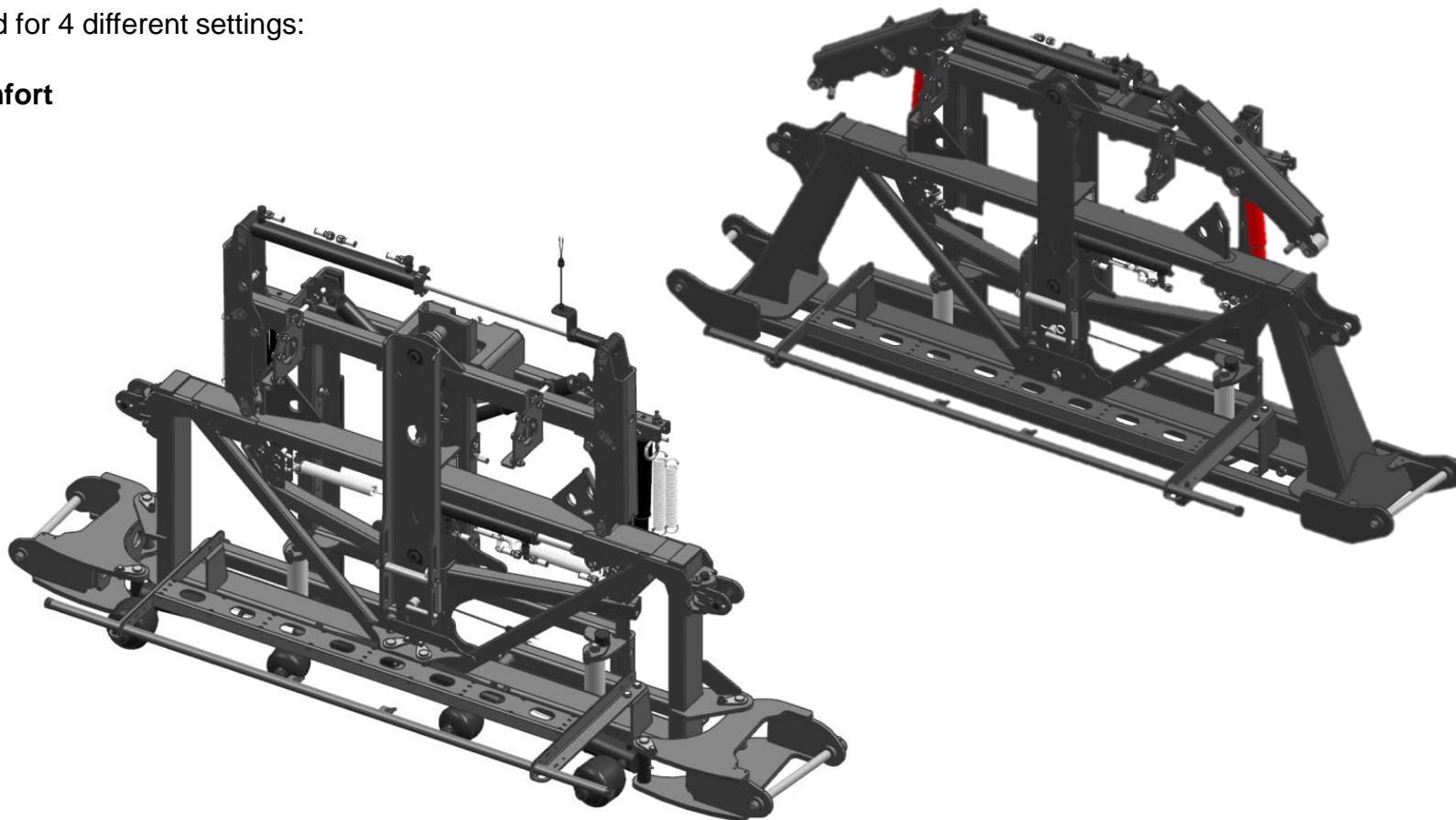
- Loosen the check nut by a few turns.
- Set the adjusting bolt such that the spray parts lie vertically in one line.
- Fasten the check nut again.

3. HC

3.12 Balancing HC

The boom can be adjusted for 4 different settings:

- **Hilly/BoomGuide Comfort**
- **Flatland position**
- **Universal**
- **BoomGuide Pro**



Check for all settings regarding balancing
‘TSM Middle frame settings - sprayers’

4. HSS

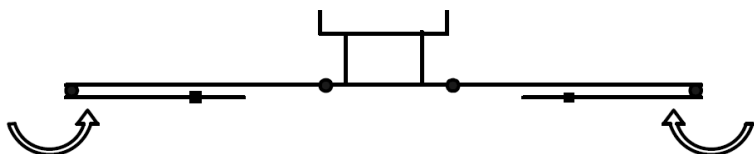
4.1 General information



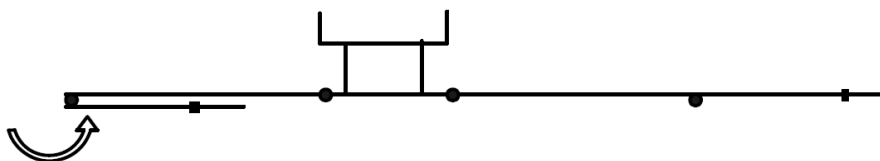
- Working width : 18 - 40 mtr
 - HSS small 18-24 m. (2 part folded)
 - HSS small 27-30 m. (3 part folded)
 - HSS big 27-30 m. (2 part folded)
 - HSS big 32-40 m. (3 part folded)
- 2-3 part folded
- Steel boom
- Available on iXtrack an Ikarus S (on Ikarus only HSS small)
- A-symmetric folding optional
- Parallel arm middle frame standard

4. HSS

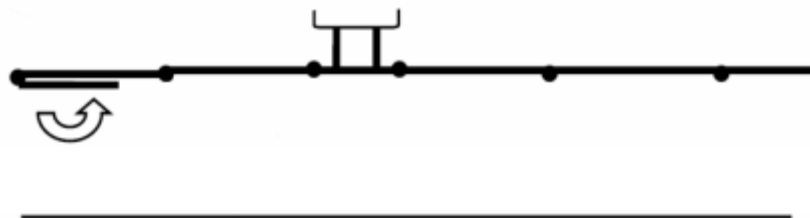
Symmetric folding with 2 part folded boom



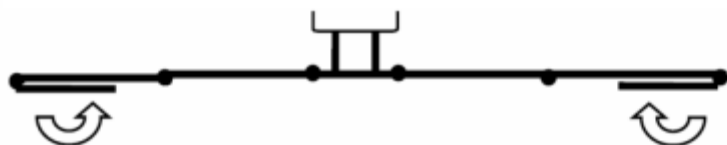
A-symmetric folding with 2 part folded boom



A-symmetric folding 3 part folded boom



Symmetric folding 3 part folded boom



HSS spray booms are standard symmetric reducible. One-sided reduction is optionally with the right hydro-pack. At 2 part folded HSS booms the last boompart + tipend can be folded in a-symmetric at 3 part folded booms the tipend can be folded a-symmetric (standard)

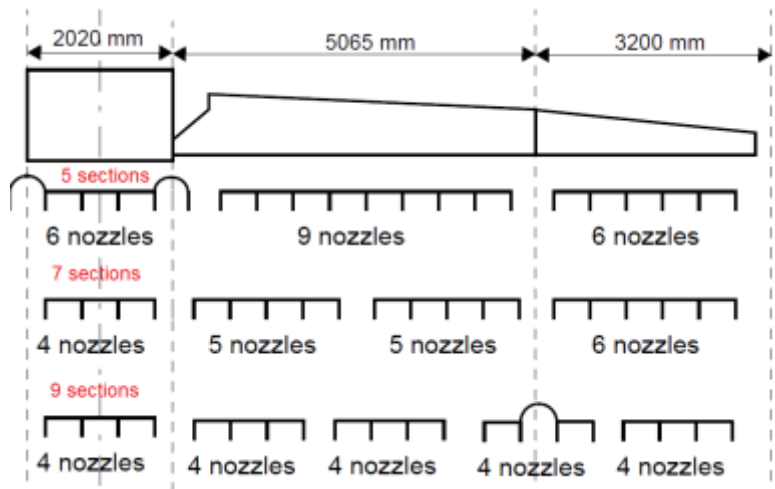
The width of the spray boom presented in the chart below is related to the steel parts of the spray boom.

Working width		Symmetric folding	A-symmetric folding
18 m.	HSS small	12 m.	15
20m.	HSS small	12 m.	16
21m.	HSS small	12 m.	16,5
24 m.	HSS small	12 m.	18
27 m.	HSS small	21 m.	24
28 m.	HSS small	21 m.	24,5
30 m.	HSS small	21 m.	24,5
27 m.	HSS big	15 m.	21 m.
28 m.	HSS big	15 m.	21,5 m.
30 m.	HSS big	15 m.	22,5 m.
32 m.	HSS big	28 m.	30 m.
33 m.	HSS big	28 m.	30,5 m.
34 m.	HSS big	28 m.	31 m.
36 m.	HSS big	28 m.	32 m.
38 m.	HSS big	28 m.	33 m.
39 m.	HSS big	28 m.	33,5 m.
40 m.	HSS big	28 m.	34 m.
42 m.	HSS big	28 m.	35 m.

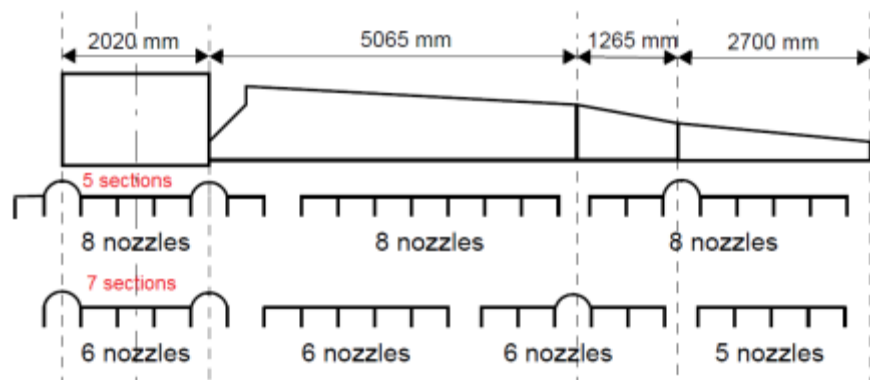
4. HSS

4.2 Sections

- *HSS small 18 m.*

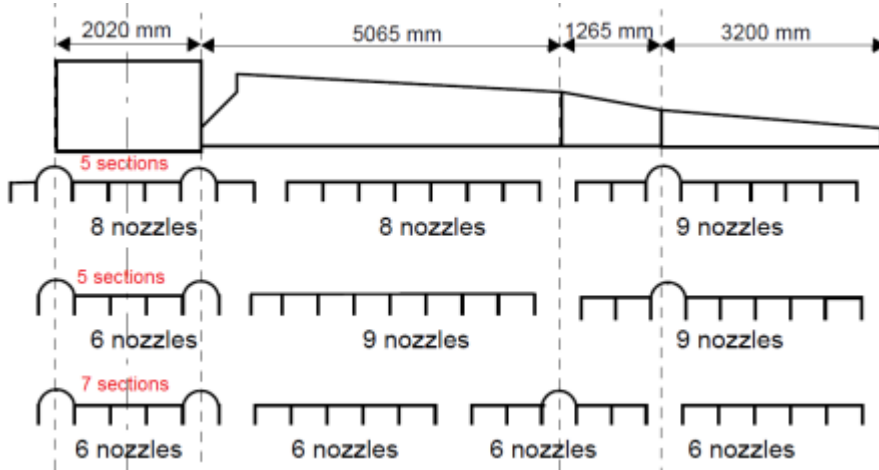


- *HSS small 20 m.*

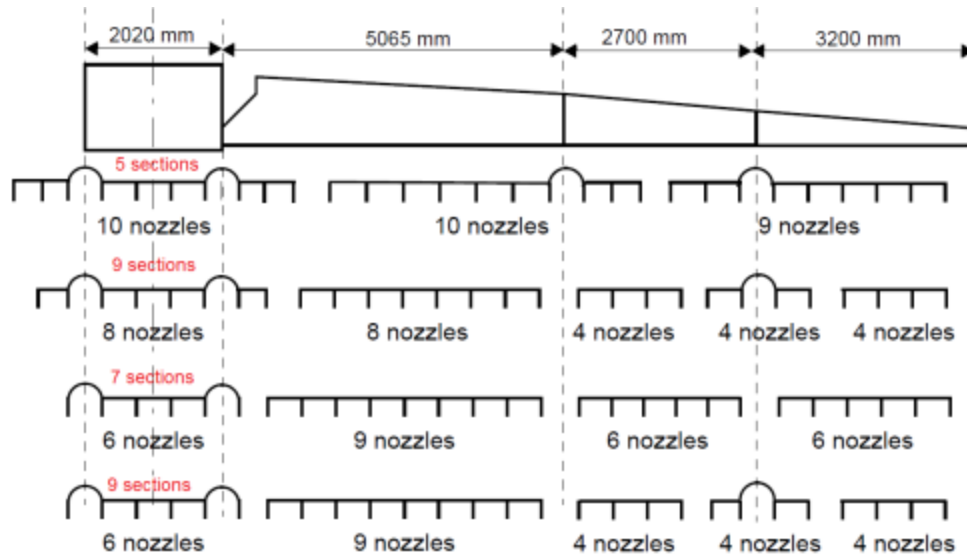


4. HSS

- *HSS small 21 m.*

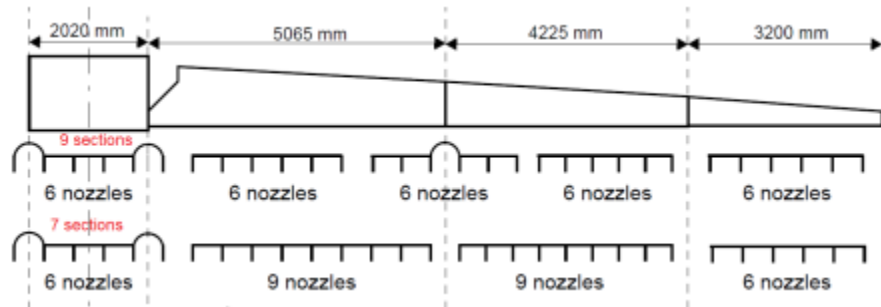


- *HSS small 24 m.*

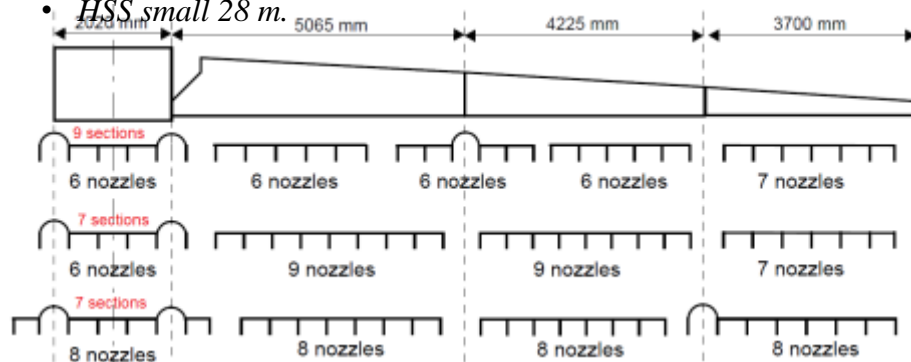


4. HSS

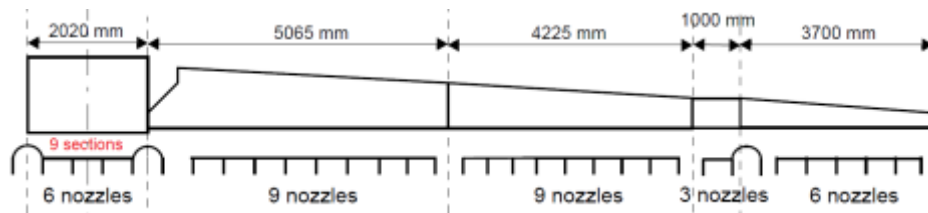
- *HSS small 27 m.*



- *HSS small 28 m.*

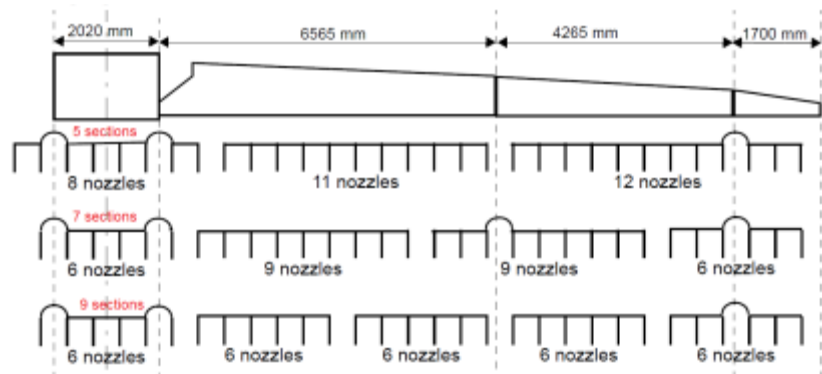


- *HSS small 30 m.*

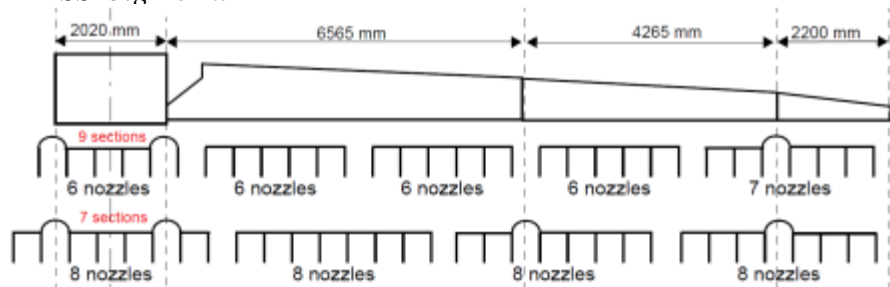


4. HSS

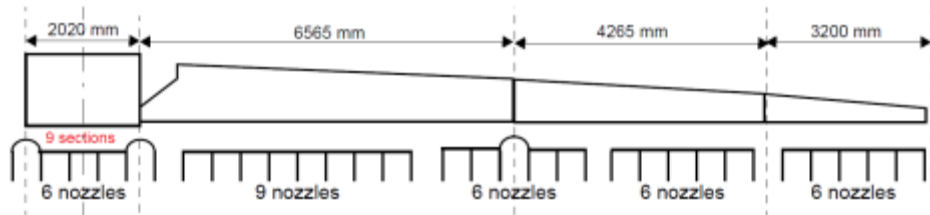
- *HSS big 27 m.*



- *HSS big 28 m.*

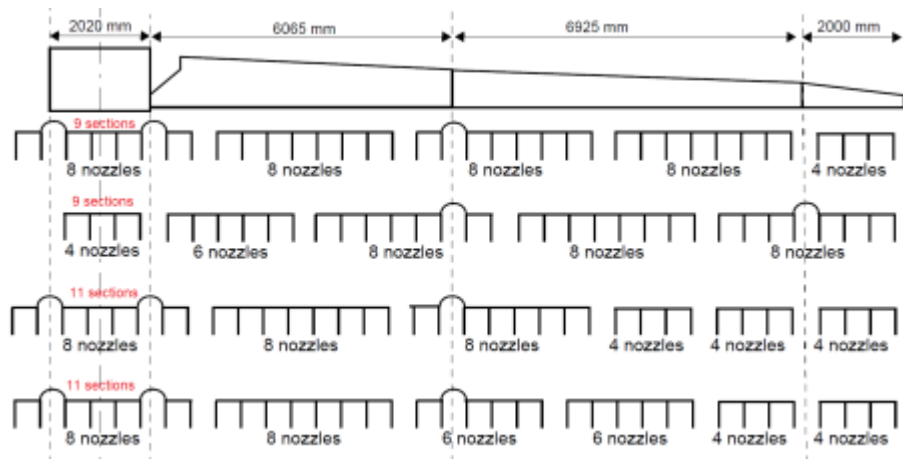


- *HSS big 30 m.*

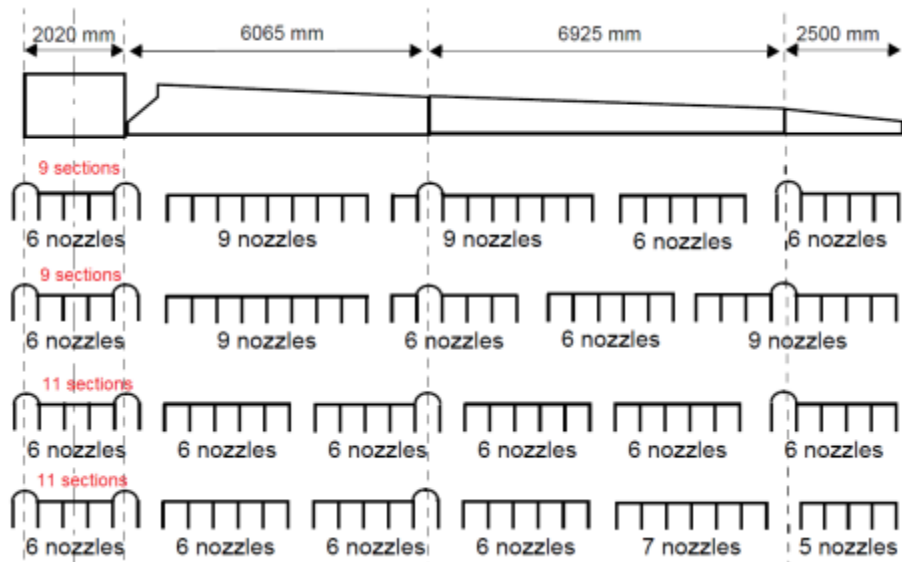


4. HSS

- *HSS big 32 m.*

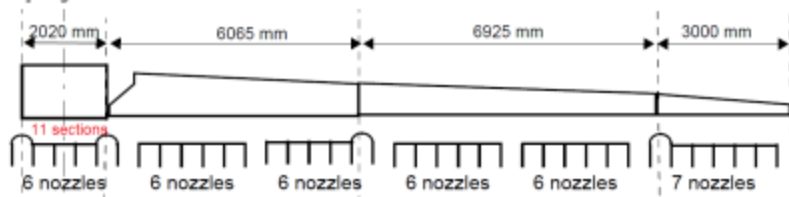


- *HSS big 33 m.*

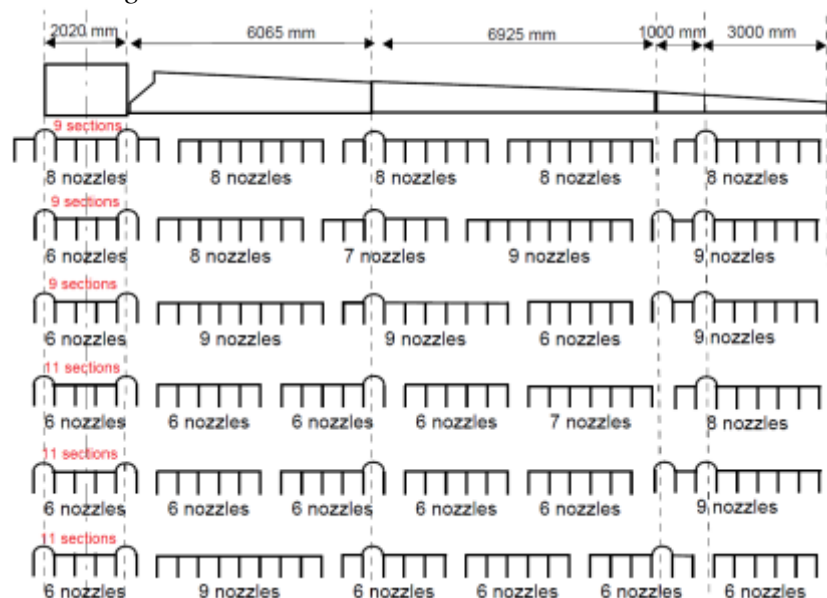


4. HSS

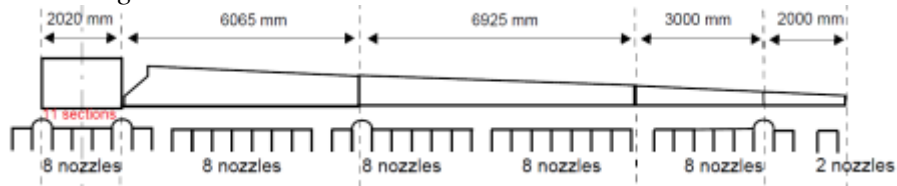
- *HSS big 34 m.*



- *HSS big 36 m.*

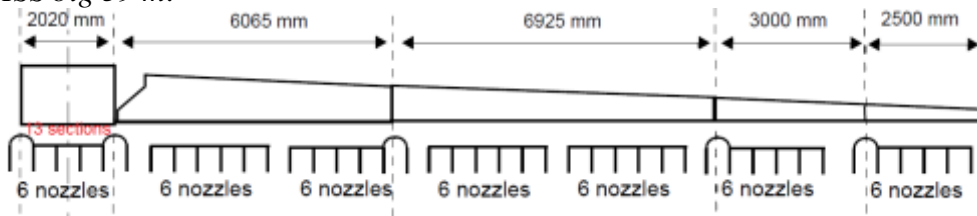


- *HSS big 38 m.*

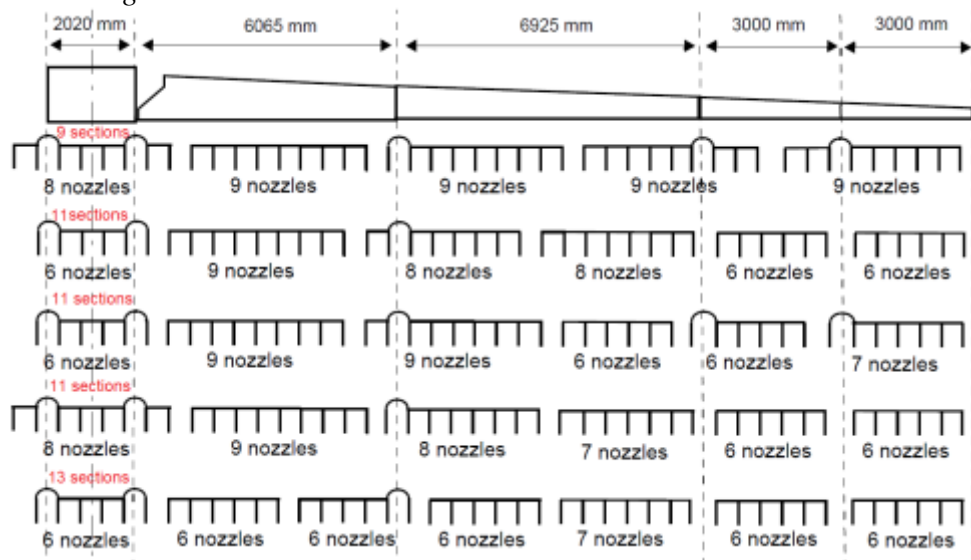


4. HSS

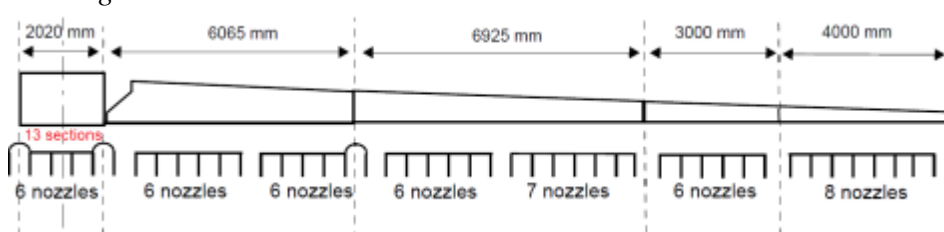
- *HSS big 39 m.*



- *HSS big 40 m.*



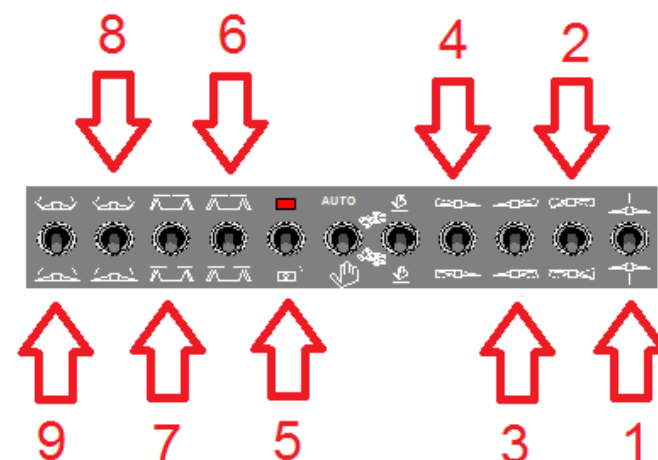
- *HSS big 42 m.*



4. HSS

4.3 Hydraulic packages

<i>Machine</i>	<i>Boom</i>	<i>Hydro pack</i>	<i>Functionality</i>	Outputs needed
Ikarus S	HSS (small) 18-24	Basic	Symmetric reducing (6+8) + Slope correction (2)	3
Ikarus S	HSS (small) 18-24	Comfort 1	OC; lift (1) + symmetric reducing (6+8) + slope correction (2)	4
Ikarus S + iXtrack	HSS (small) 18-24 +HSS (big) 33-42	Comfort 2	OC; lift(1) + symmetric reducing(6) + a-symmetric reducing (8+9) +locking(5) + slope correction(2)	6
Ikarus S + iXtrack	HSS 18-24 (small) +HSS (big) 24-42	Comfort 3	OC; lift(1) + symmetric reducing(6) + a-symmetric reducing (8+9) + locking(5) + slope correction(2) + independent slope correction 3+4)	8
iXtrack	HSS (small) 18-24 +HSS (big) 24-36	Basic	Symmetric reducing(6+8) + Slope correction(2) + locking(5)	4
iXtrack	HSS (small) 18-24 +HSS (big) 24-42	Comfort 1	OC; lift(1) + symmetric reducing (6+8) + slope correction(2) +locking(5)	5
Ikarus S iXtrack	HSS small 27-30	Basic	Symmetric reducing (6+7+8) +Slope correction (2) iXtrack +locking (5)	4 5
Ikarus S iXtrack	HSS small 27-30	Comfort 1	OC; lift(1)+ Symmetric reducing (6+7+8) +Slope correction (2) iXtrack +locking (5)	5 6
Ikarus S iXtrack	HSS small 27-30	Comfort 2	OC; lift(1)+ Symmetric reducing 1e+2e (6+7) +A symmetric tipends (8+9) Slope correction (2) +locking (5)	7
Ikarus S iXtrack	HSS small 27-30	Comfort 3	OC; lift(1)+ Symmetric reducing 1e+2e (6+7) +A symmetric tipends (8+9) Slope correction (2) +locking (5)+indep. Slope correction (3+4)	9

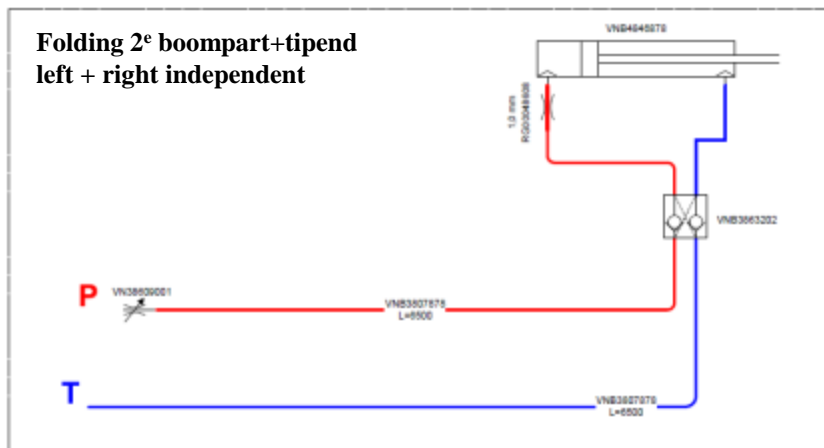
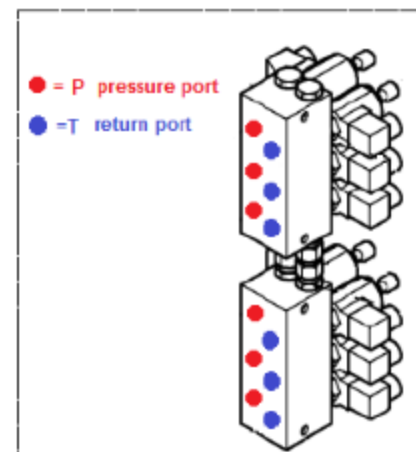
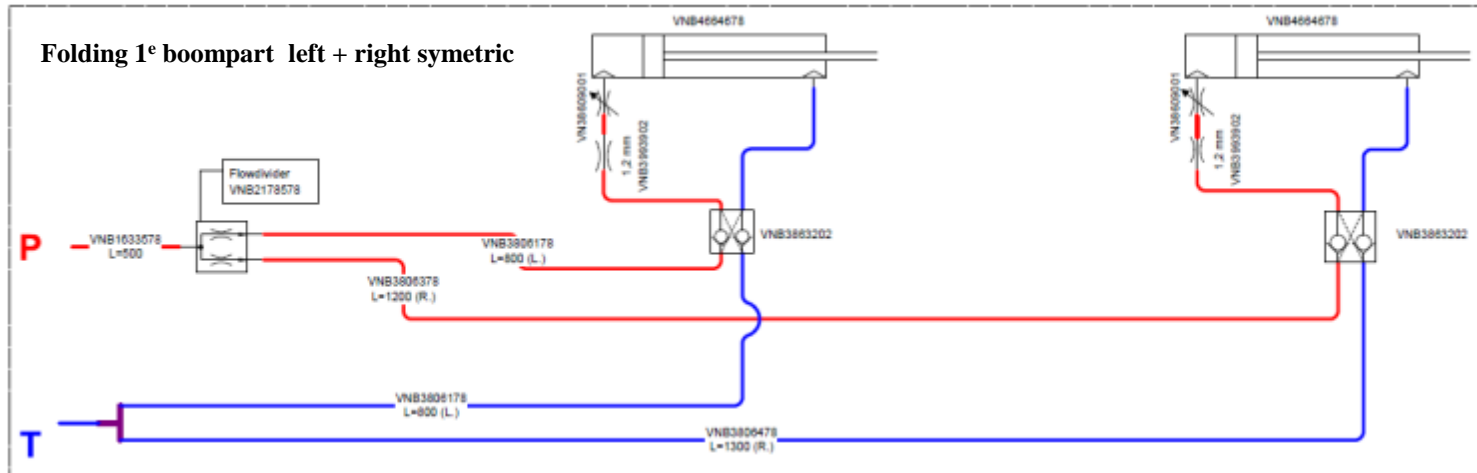


4. HSS

4.4 Hydraulic schedules

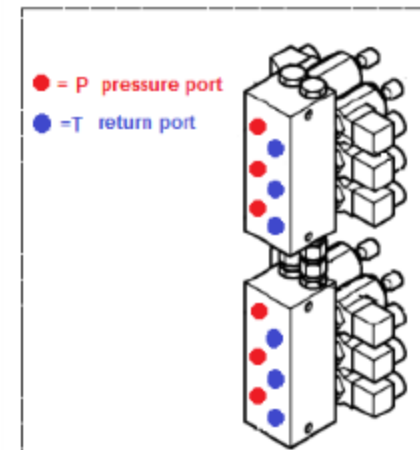
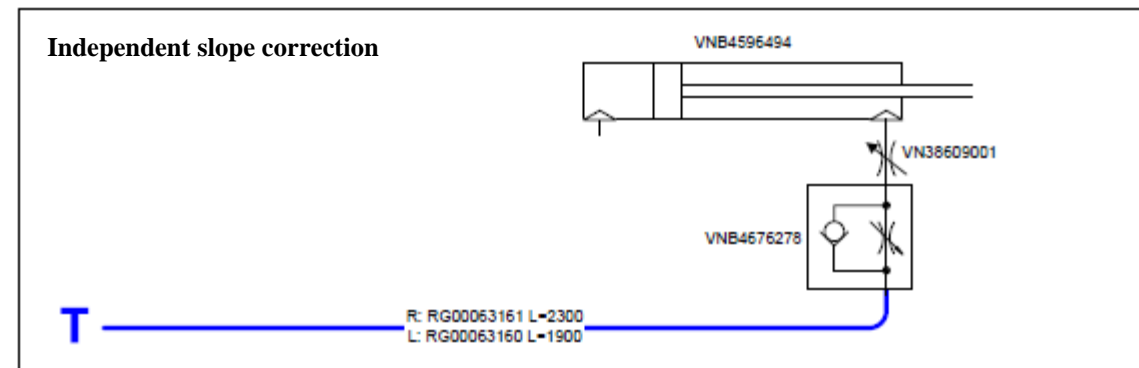
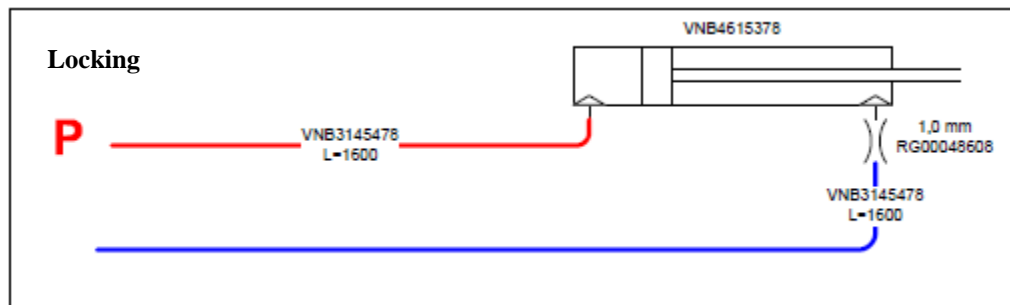
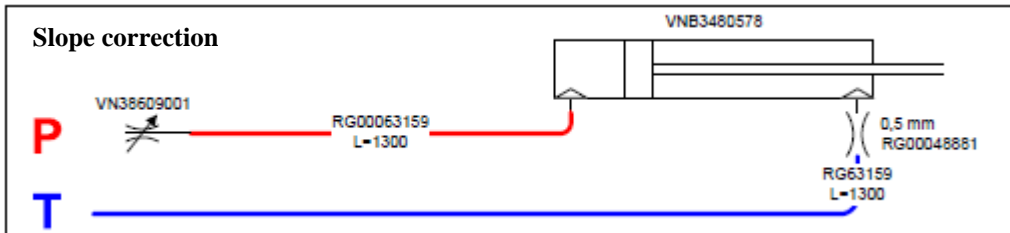
- Folding out – pressure on T
- Folding in – pressure on P

HSS 18-24



4. HSS

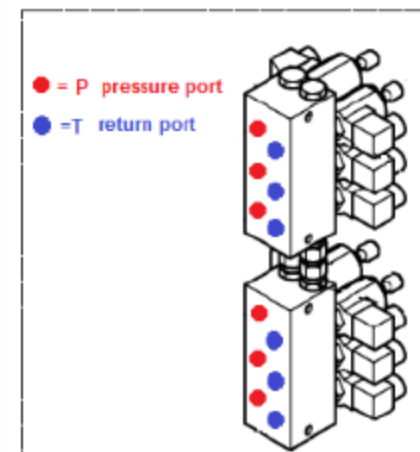
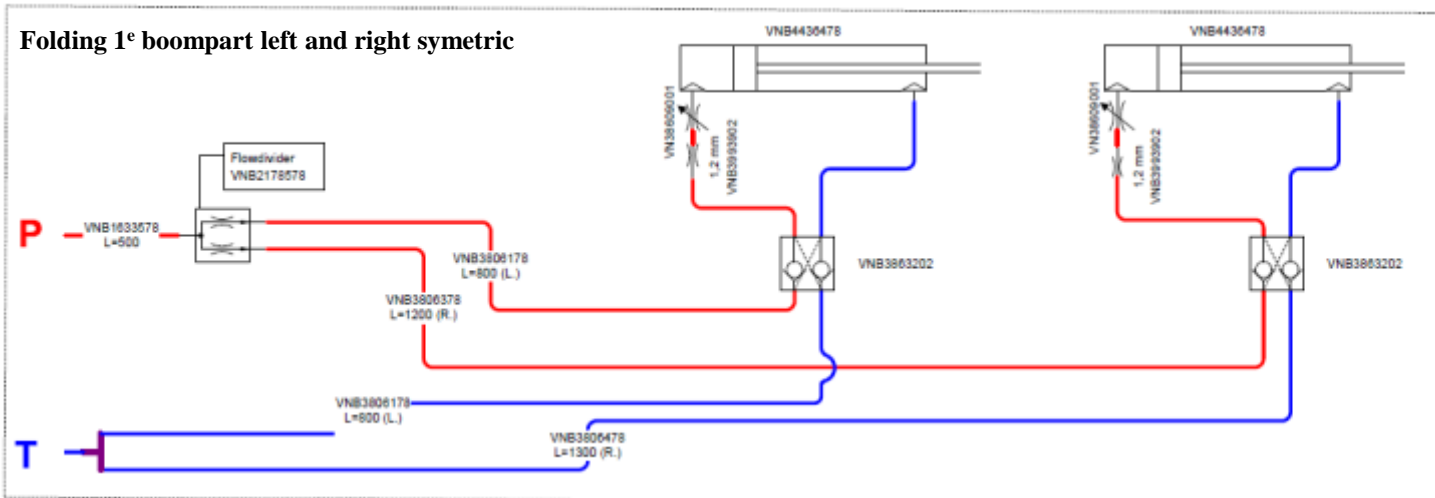
HSS 18-24



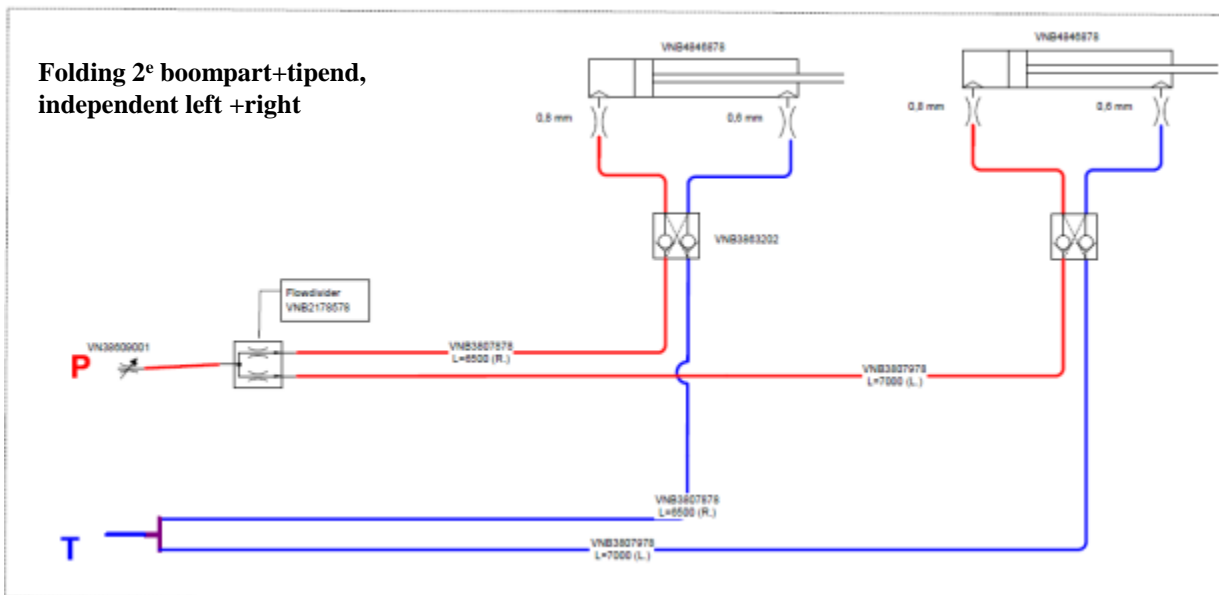
4. HSS

HSS small 27-30

Folding 1° boompart left and right symetric



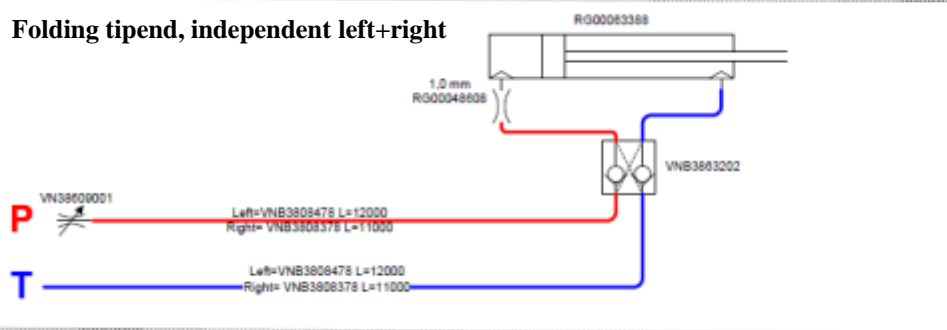
Folding 2° boompart+tipend, independent left +right



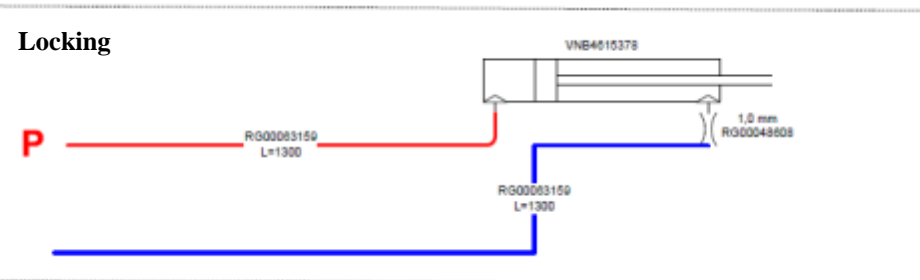
4. HSS

HSS small 27-30

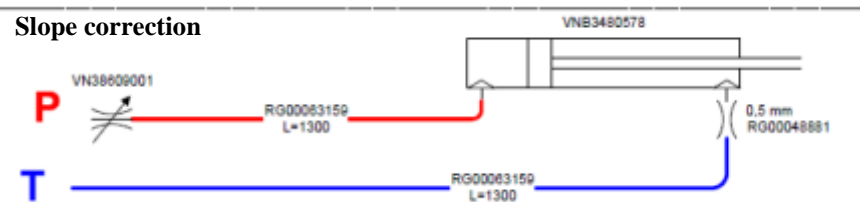
Folding tipend, independent left+right



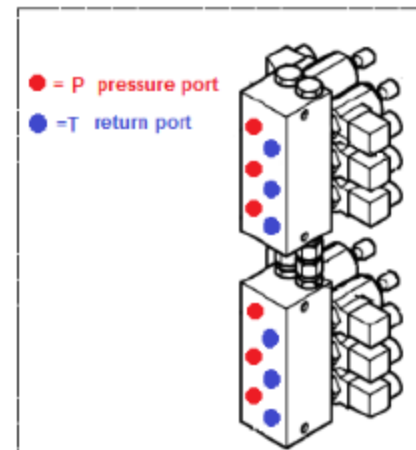
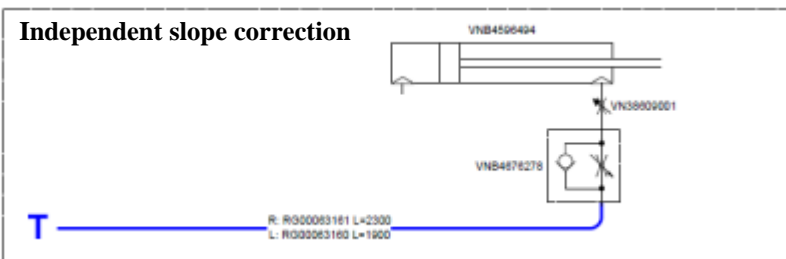
Locking



Slope correction



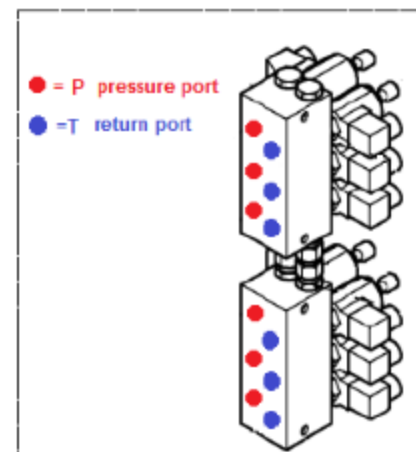
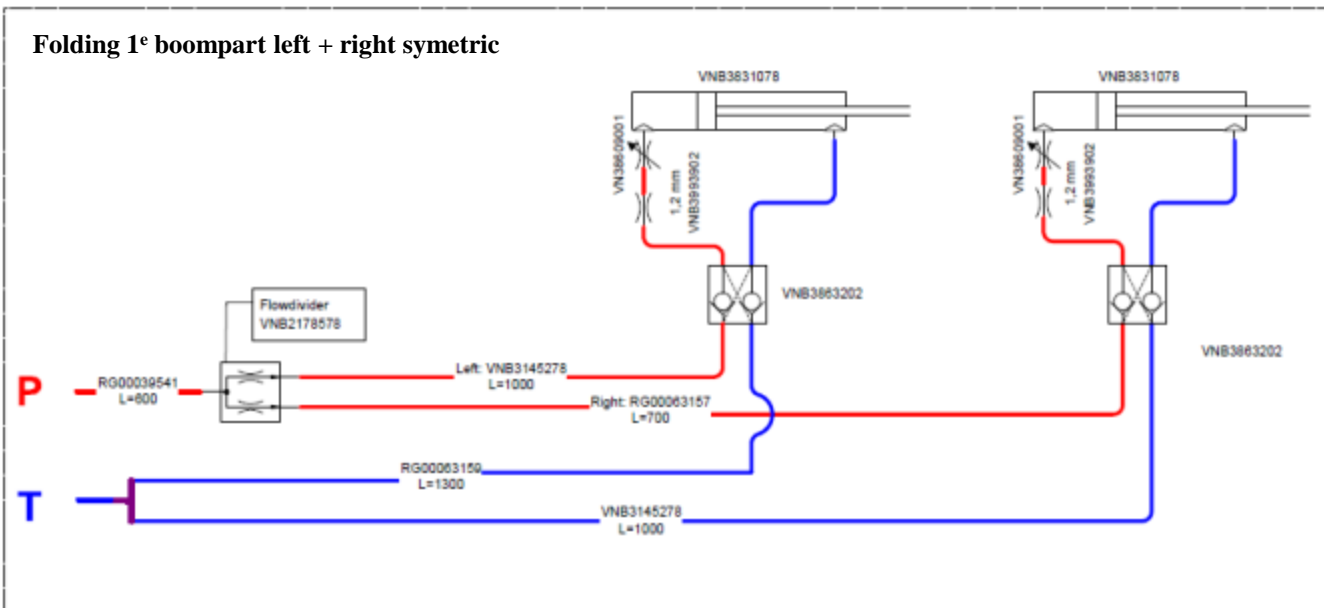
Independent slope correction



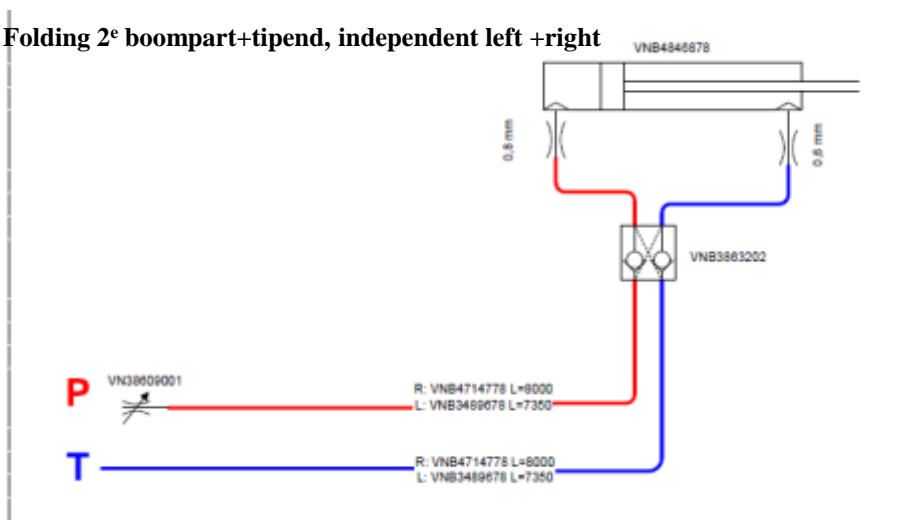
4. HSS

HSS big 27-30

Folding 1° boompert left + right symetric

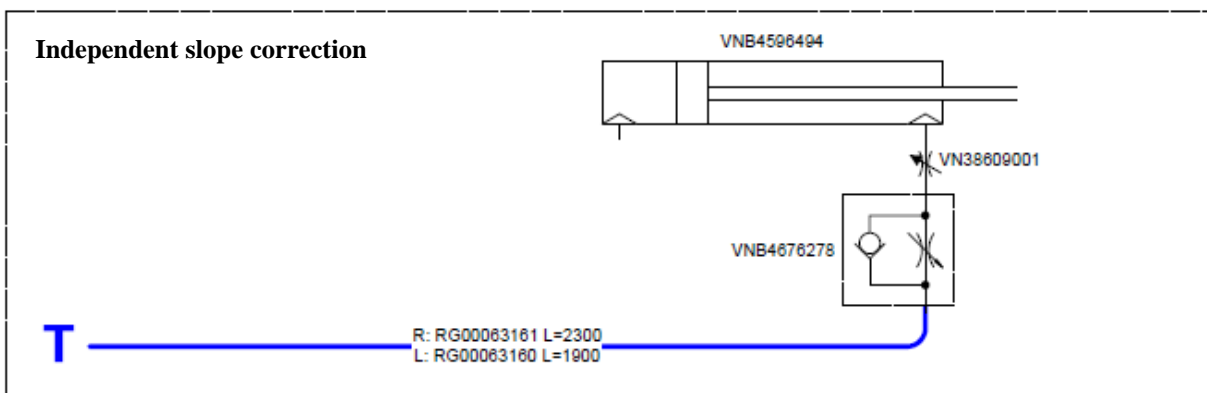
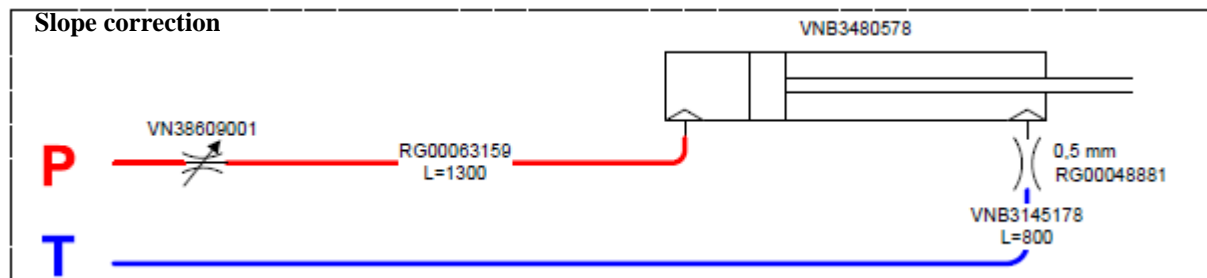
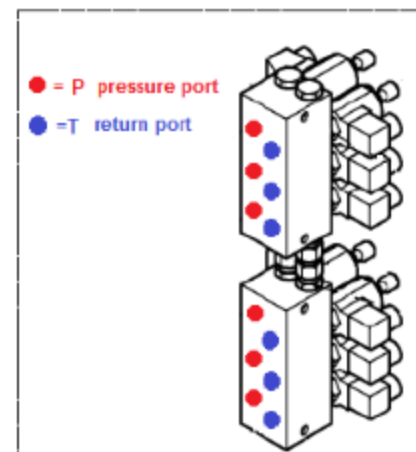
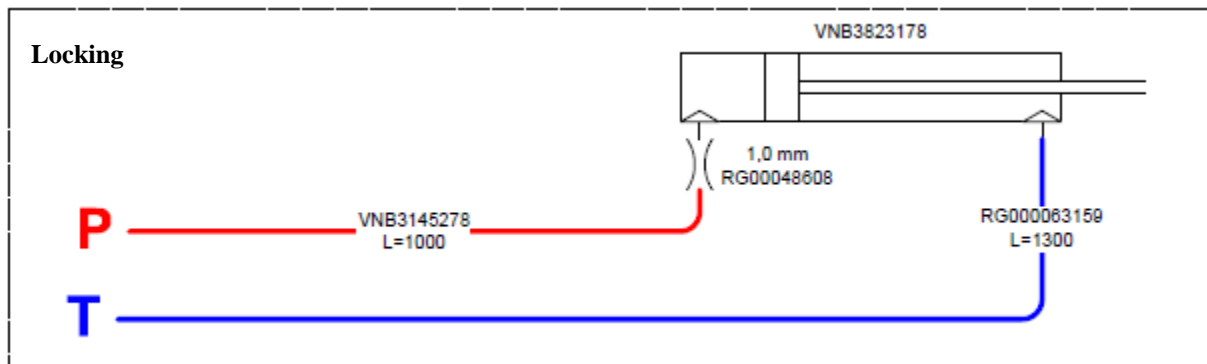


Folding 2° boompert+tipend, independent left +right



4. HSS

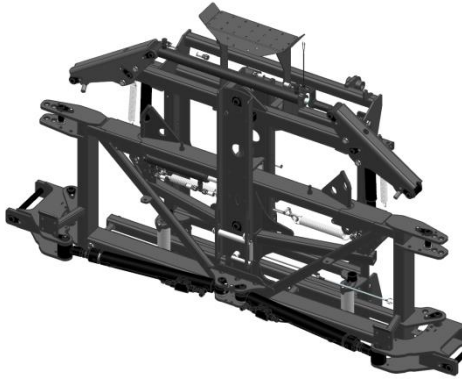
HSS big 27-30



4. HSS

4.5 Middle frame

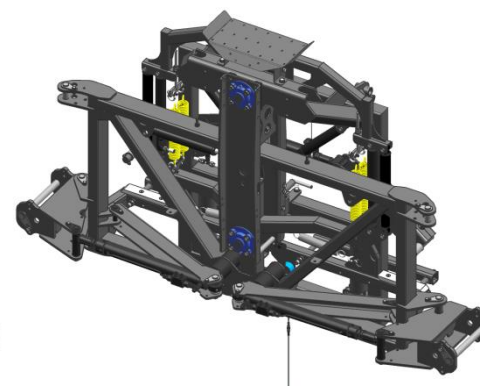
HSS small 18-24 (2-pf)



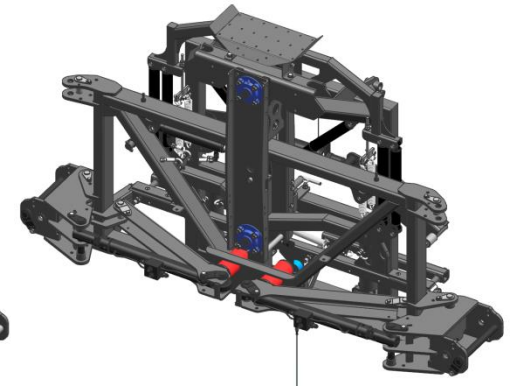
HSS small 27-30 (3-pf)



HSS big 27-30 (2-pf)



HSS big 32-42 (3-pf)



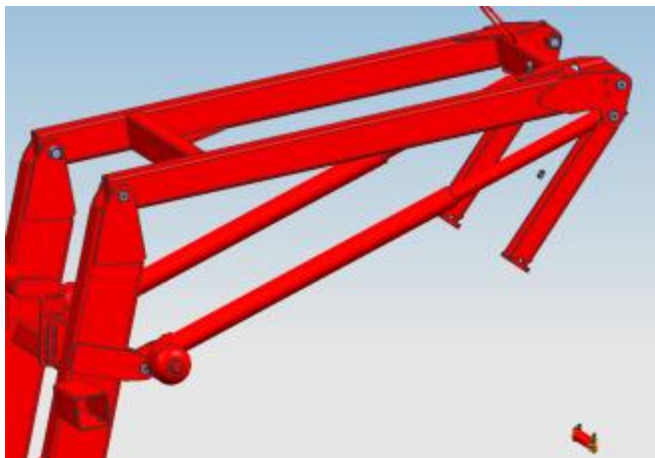
There are 3 different middle frames for the HSS spraybooms

- 1) HSS small 18-24 (middle frame changed for HSS small in 04-2014)
- 2) HSS small 27-30 (3-pf)
- 2) HSS big 27-30 (2-pf) also used for HSA booms
- 3) HSS big 32-42 (3-pf)

Check for all settings regarding balancing
‘TSM Middle frame settings - sprayers’

4. HSS

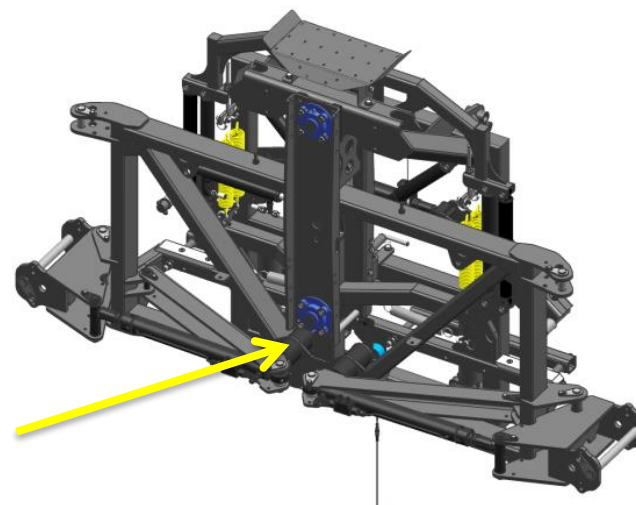
4.6 Vertical damping



The boom has vertical damping by the accumulators of the cylinders in the parallelogram

Sprayboom	Sprayer	Pressure
HSS small 18-24	Ikarus S	55 Bar
HSS small 18-24	iXtrack	80 Bar
HSS small 27-30	Ikarus S	100 Bar
HSS small 27-30	iXtrack	80 Bar
HSS big 27-30	iXtrack	80 Bar
HSS big 32-42	iXtrack	80 Bar

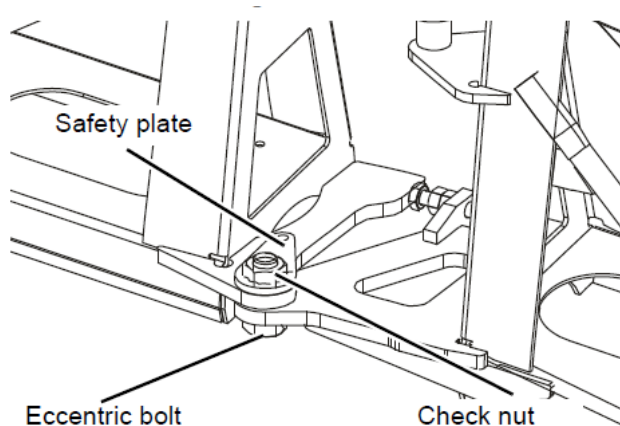
4.7 Horizontal damping



The horizontal damping of the HSS boom is done by rubber buffers in the middle frame.

4. HSS

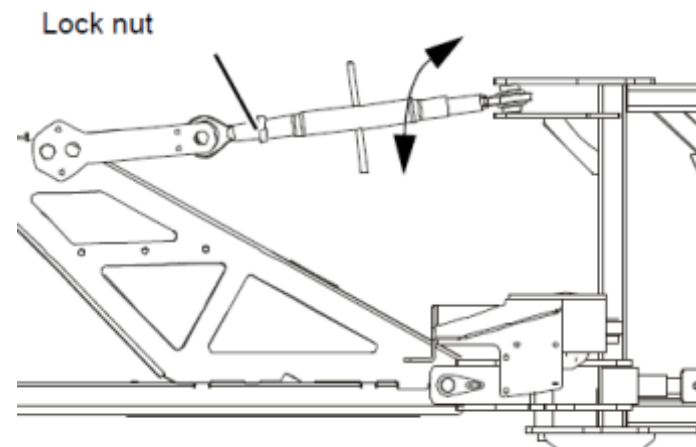
4.8 Boom adjustments



Horizontal setting of the spray boom parts

The outer side parts can be brought in line horizontally by setting the eccentric bolts. Start adjusting from the middle part to the outside.

- Unscrew the bolt which is holding the safety plate.
- Remove the safety plate.
- Loosen the lock nut by a few turns.
- Adjust the eccentric bolt such that the spray parts lie horizontally in one line.
- Fasten the check nut again.
- Place the safety plate back over the check nut.
- - Screw the bolt which is holding the safety plate again.

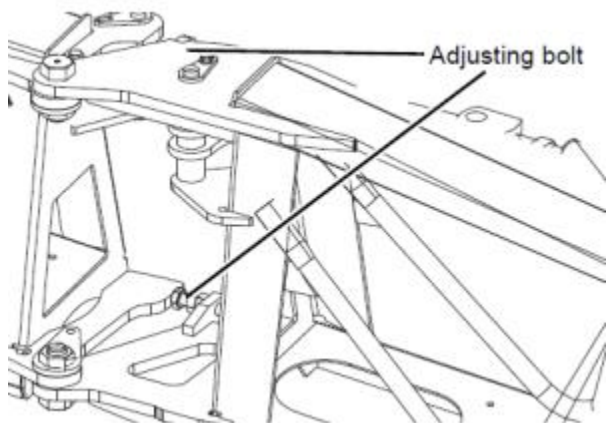


Horizontal setting of the middle section

The inner spray boom parts can be brought in line horizontally by setting the top link. Turn the top link using a rod so that the spray boom is hanging horizontally.

- Loosen the lock nut by a few turns.
- Adjust the top link until the boom is horizontal.
- Tighten the lock nut again.

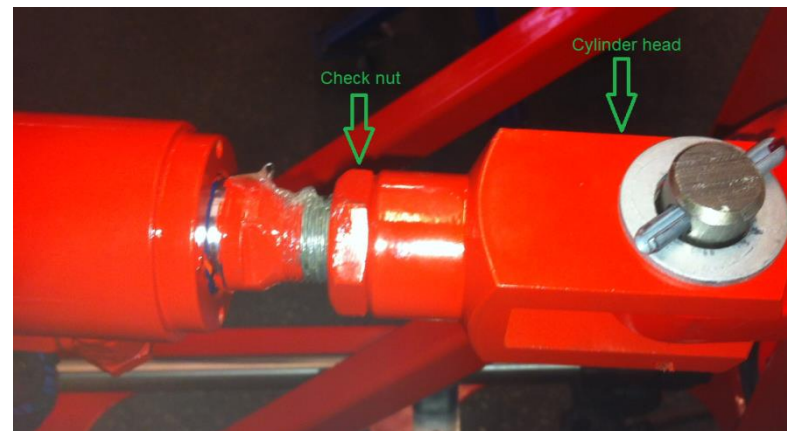
4. HSS



Vertical settings booms folded out

Adjust both stop bolts, at the front and rear of the hinge, simultaneously. The side part must lie against both stop bolts.

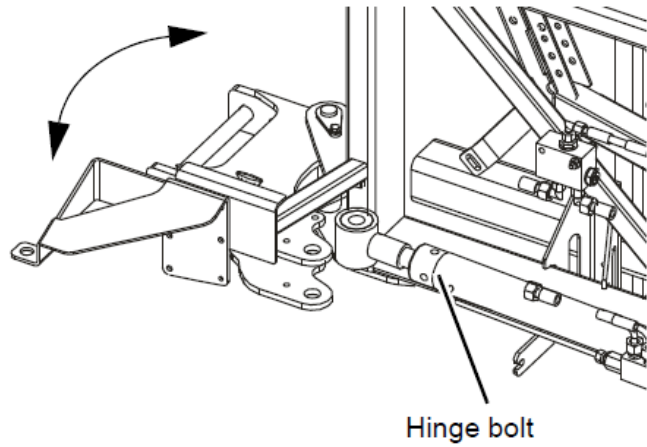
- Loosen 1 lock nut on both stop bolts by a few turns, depending on the direction the stop bolts have to be adjusted.
- Adjust the length of the stop bolts by turning the other lock nut until the spray boom part is hanging vertically.
- Fasten the first lock nut again, without changing the length of the stop bolts.



Vertical settings booms folded in

When the boom parts are folded in they should be pushed against the rubber buffers. This should be done with a force of "5 kg". If the boom is pushed too hard/soft against the rubber buffer the folding cylinder can be turned in or out.

- Loosen the check nut
- Turn in or out the cylinder head
- Fasten the check nut again



Vertical setting of the middle section

The vertical direction of the side parts can be set in line using the hinge bolt. Turn the hinge bolt to the right until the side part is hanging in a horizontal line with the other side part.

5.1 General information



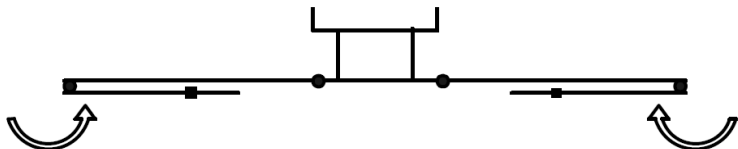
- Working width 21 -33 m.
 - 21 m. / 24 m. / 27 m. / 28 m. / 30 m. / 32 m. / 33 m.
- Only available on iXtrack
- Aluminum boom
- 2 part folded
- A-symmetric folding optional
- Parallel arms in middle frame standard

5. HSA

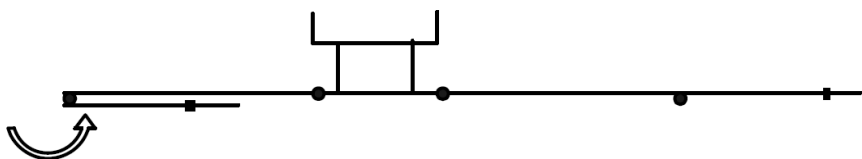
5.2 Sections

HSA spray booms are standard symmetric reducible. One-sided reduction is optionally with the right hydro-pack. The last boompart+tipend can be folded in a-symmetric. The width of the spray boom presented in the chart below is related to the steel parts of the spray boom.

Symmetric folding with 2 part folded boom



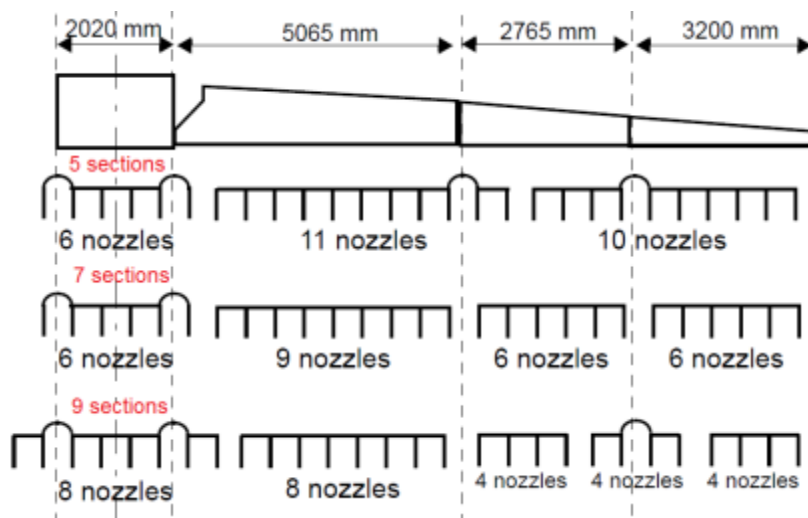
A-symmetric folding with 2 part folded boom



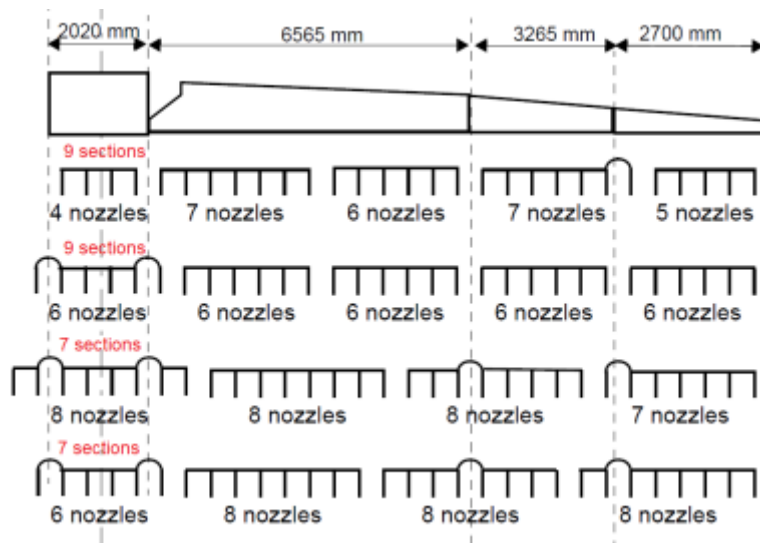
Working width	Symmetric folding	A-symmetric folding
24 m.	12 m.	18m.
27 m.	15m.	21 m.
28 m.	15m.	21,5 m.
30 m.	15m.	22,5 m.
32 m.	17 m.	24,5 m.
33 m.	17 m.	25 m.

5. HSA

- *HSA 24 m.*

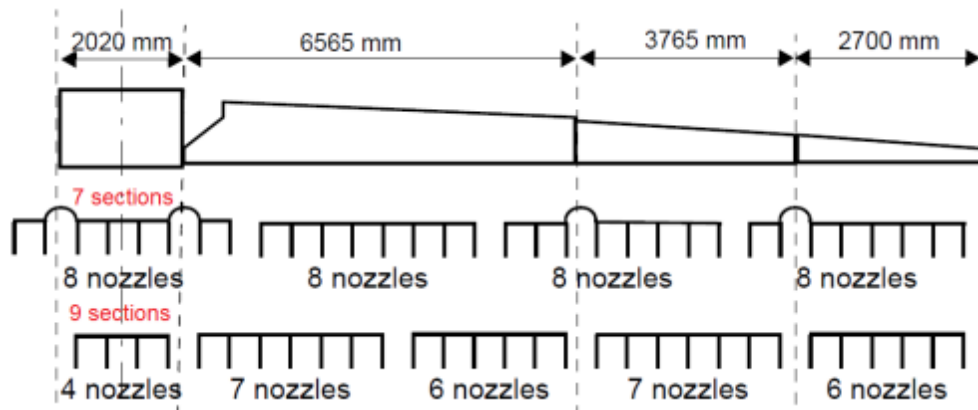


- *HSA 27 m.*

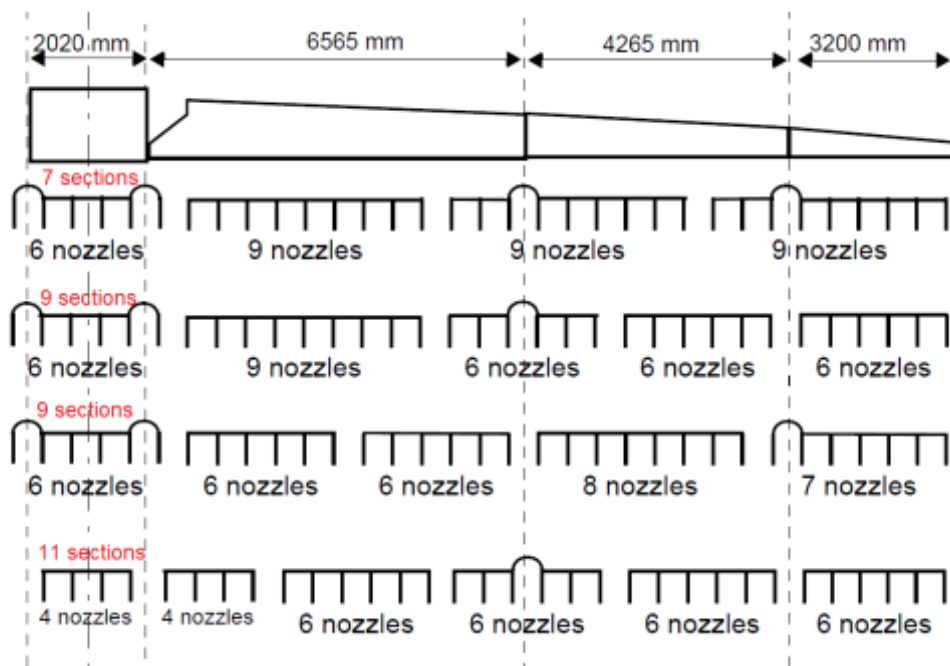


5. HSA

- *HSA 28 m.*

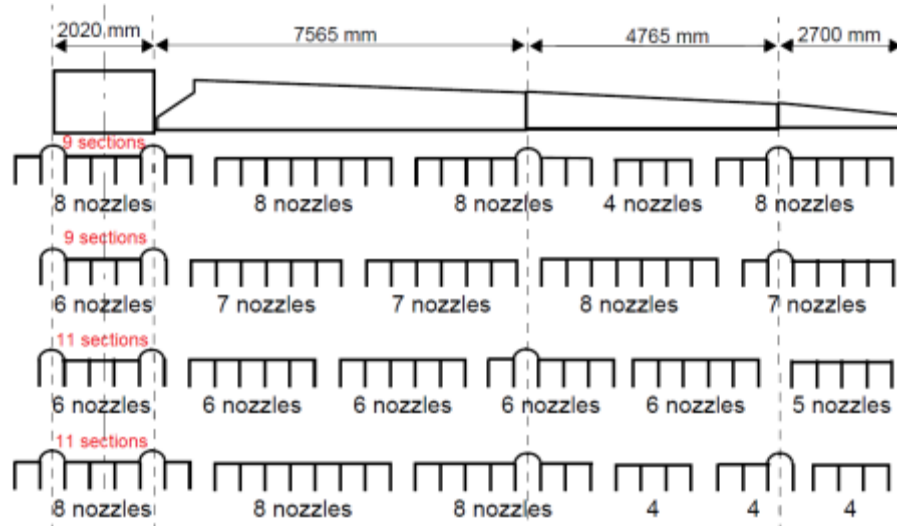


- *HSA 30 m.*

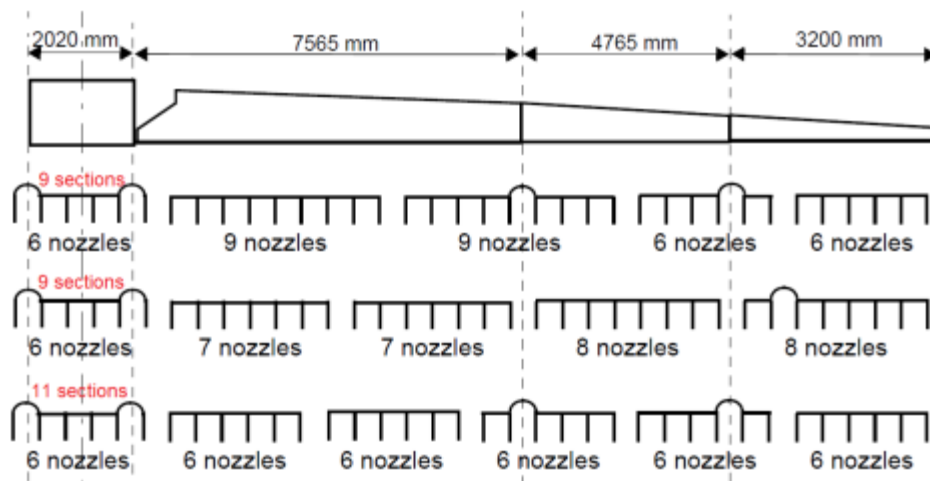


5. HSA

- *HSA 32 m.*



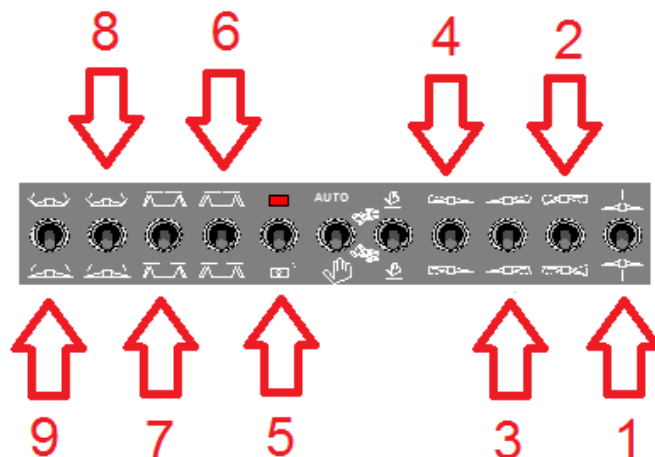
- *HSA 33 m.*



5. HSA

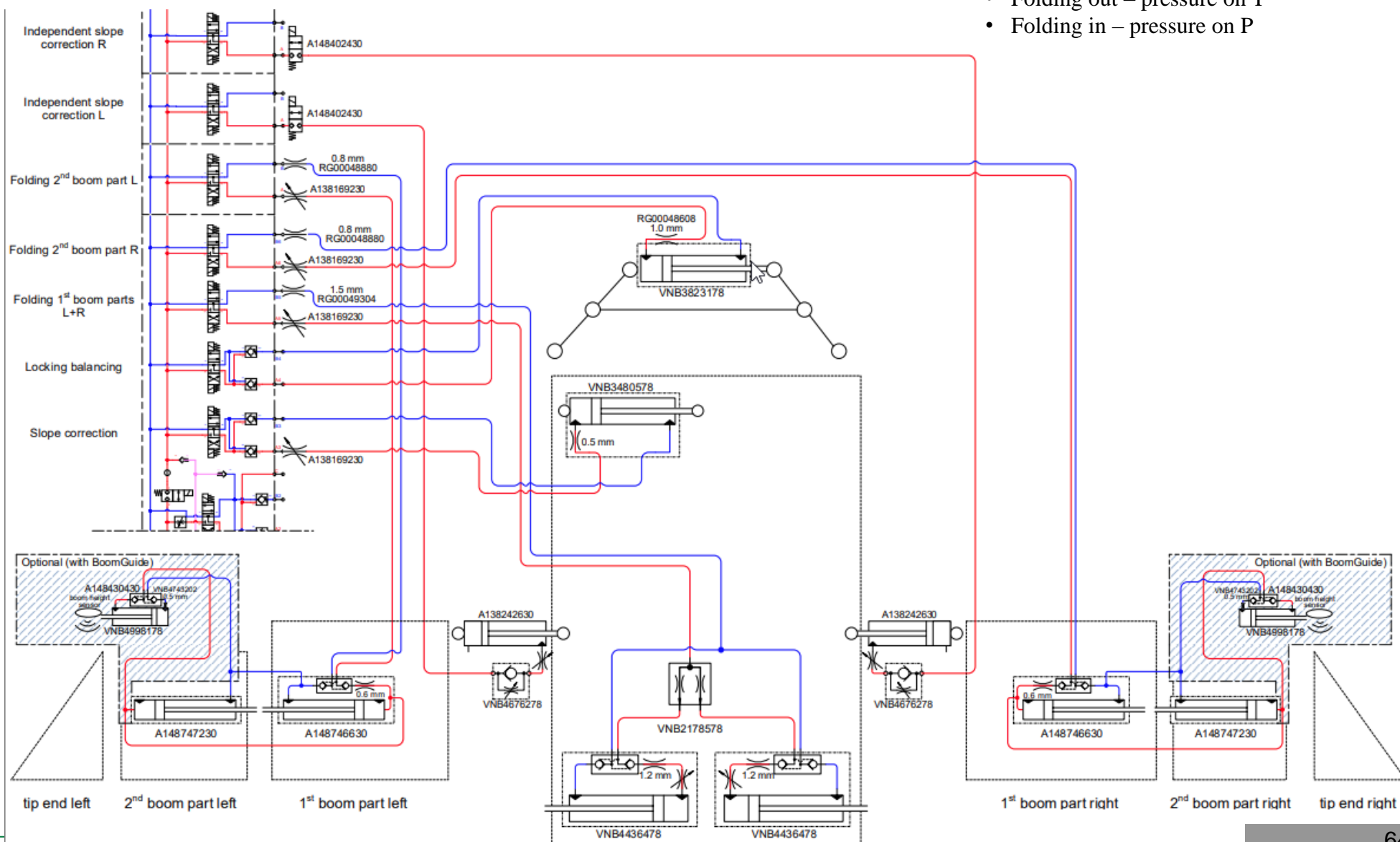
5.3 Hydraulic packages

<i>Machine</i>	<i>Boom</i>	<i>Hydro pack</i>	<i>Functionality</i>	<i>Outputs needed</i>
iXtrack	HSA	Basic	Symmetric reducing(6+8) + Slope correction(2) + locking(5)	4
iXtrack	HSA	Comfort 1	Oil Circulation; lift(1) + symmetric reducing(6+8) + slope correction(2) +locking(5)	5
iXtrack	HSA	Comfort 2	Oil Circulation; lift(1) + symmetric reducing(6) + a-symmetric reducing (8+9) +locking(5) + slope correction(2)	6
iXtrack	HSA	Comfort 3	Oil Circulation; lift(1) + symmetric reducing(6) + a-symmetric reducing (8+9) + locking(5) + slope correction(2) + independent slope correction (3+4)	8



5.4 Hydraulic schedules

- Folding out – pressure on T
- Folding in – pressure on P

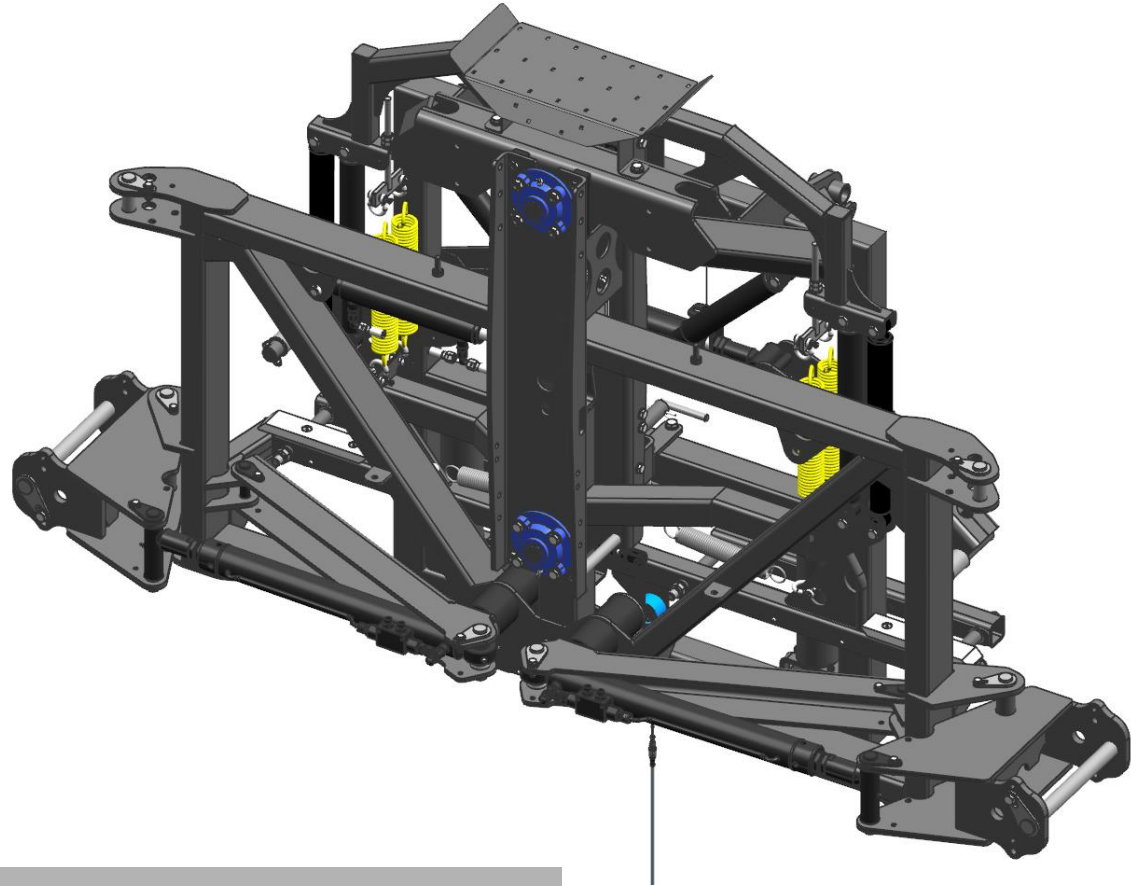


5. HSA

5.5 Middle frame

There is only one frame for the HSA spraybooms (this is the same middle frame than on the HSS 27-30mtr (2-pf)

1) HSA 24-33 m.



Check for all settings regarding balancing
‘TSM Middle frame settings - sprayers’

5. HSA

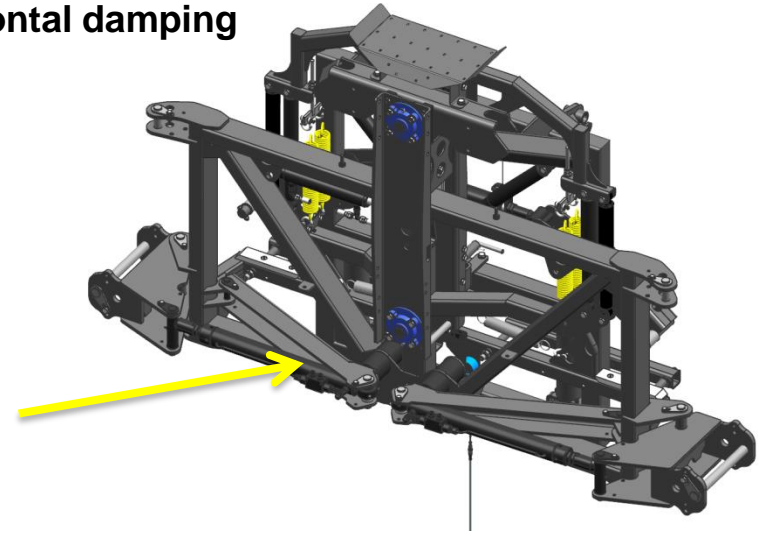
5.6 Vertical damping



The boom has vertical damping by the accumulators of the cylinders in the parallelogram

The accumulators are filled with 80 Bar

5.7 Horizontal damping

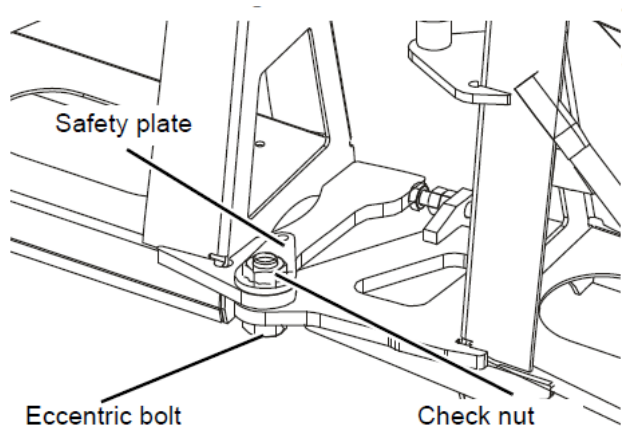


The horizontal damping of the HSA boom is done by rubber buffers in the middle frame.

Sprayboom	Buffer front	Buffer back
HSA 21-33	80 mm (black)	80 mm (black)

5. HSA

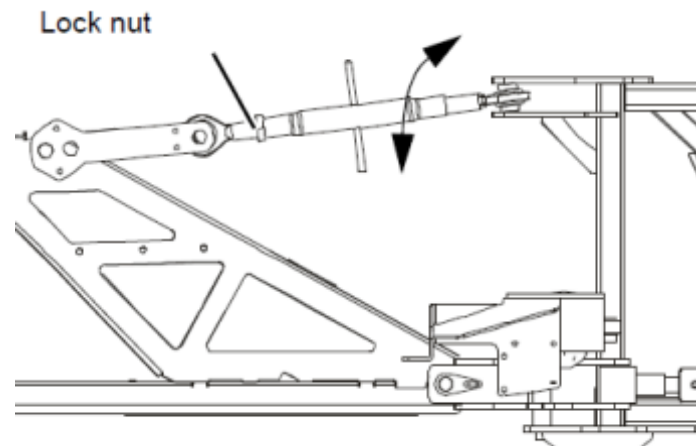
5.8 Boom adjustments



Horizontal setting of the spray boom parts

The outer side parts can be brought in line horizontally by setting the eccentric bolts. Start adjusting from the middle part to the outside.

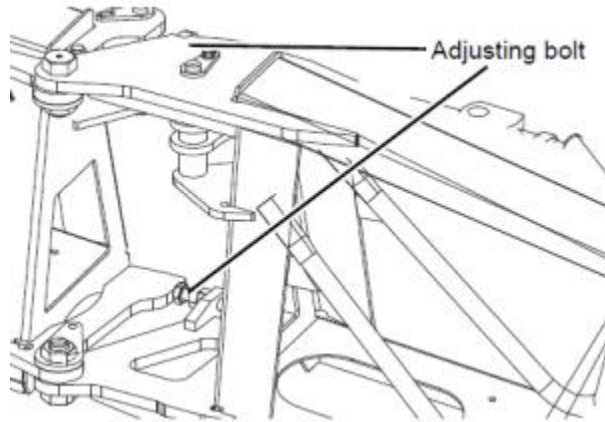
- Unscrew the bolt which is holding the safety plate.
- Remove the safety plate.
- Loosen the lock nut by a few turns.
- Adjust the eccentric bolt such that the spray parts lie horizontally in one line.
- Fasten the check nut again.
- Place the safety plate back over the check nut.
- - Screw the bolt which is holding the safety plate again.



Horizontal setting of the middle section

The inner spray boom parts can be brought in line horizontally by setting the top link. Turn the top link using a rod so that the spray boom is hanging horizontally.

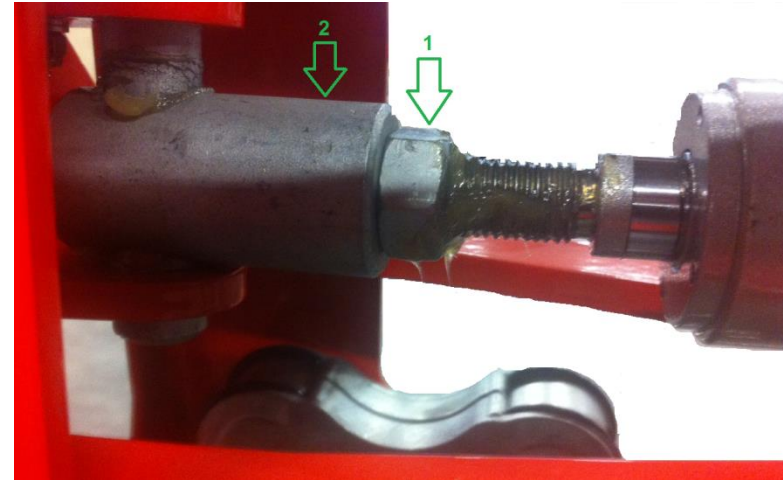
- Loosen the lock nut by a few turns.
- Adjust the top link until the boom is horizontal.
- Tighten the lock nut again.



Vertical settings booms folded out

Adjust both stop bolts, at the front and rear of the hinge, simultaneously. The side part must lie against both stop bolts.

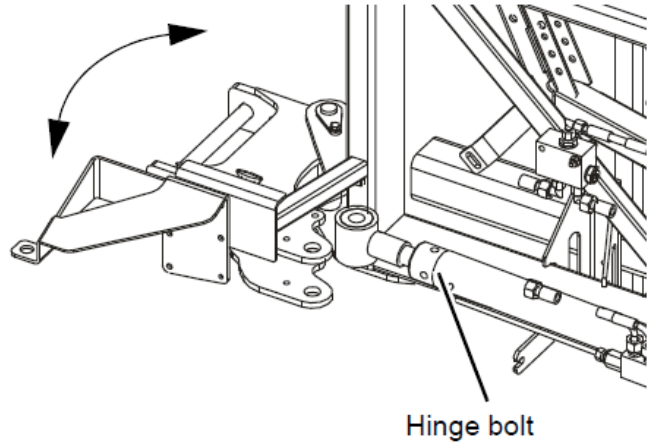
- Loosen 1 lock nut on both stop bolts by a few turns, depending on the direction the stop bolts have to be adjusted.
- Adjust the length of the stop bolts by turning the other lock nut until the spray boom part is hanging vertically.
- Fasten the first lock nut again, without changing the length of the stop bolts.



Vertical settings booms folded in

When the boom parts are folded in they should be pushed against the rubber buffers. This should be done with a force of "5 kg". If the boom is pushed too hard/soft against the rubber buffer the folding cylinder can be turned in or out.

- Loosen the check nut (1)
- Turn in or out the cylinder head (2)
- Fasten the check nut again



Vertical setting of the middle section

The vertical direction of the side parts can be set in line using the hinge bolt. Turn the hinge bolt to the right until the side part is hanging in a horizontal line with the other side part.