MASTERDRIVES VC function diagram - List of contents of the basic functions

The following function diagrams are **not** in this instruction (sep. exc. sync.):

- 251 -	- 383 -	- 431 -
- 369 -	- 384 -	- 487 -
- 373 -	- 391 -	- 551 -
- 374 -	- 397 -	

MASTERDRIVES VC function diagram - List of contents

of the free blocks

of the supplementary boards

Page	Title	V/f control			n control		f control		T control
		V/f char.	+ n ctrl	Textile	Master dr.	Slave dr.	Master dr.	Slave dr.	
280	Measured-value sensing	x	x	x	x	x	x	x	x
285	Evaluation of set/actual values for voltage/current/torque/output				x	x	x	x	x
286	Evaluation of set/actual values for V/f open-loop control	x	x	x					
316	Setpoint channel (part 1), master drive	x	x	x	x		x		
317	Setpoint channel (part 2), master drive	x	x	x	x		x		
318	Setpoint channel (part 3), master drive	x	x	x	x		x		
319	Setpoint channel (part 4), master drive	x	x	x	x		x		
320	Setpoint channel, slave drive					x		x	x
350	Speed/position processing				x	x			x
351	Speed processing						x	x	
352	V/f characteristic with speed controller		x						
360	Speed controller				x				
361	Speed limiting controller					x			x
362	Speed controller						x		
363	Speed limiting controller							x	
364	V/f characteristic with speed controller		x						
365	DT1 element, droop and torque pre-control				x				
366	DT1 element, torque control and speed control, slave drive					x			x
367	DT1 element, droop and torque pre-control						x		
370	Torque/current limitation				x				
371	Torque/current limitation					x			x
372	Torque/current limitation						x		
373	Torque/current limitation							x	
375	Fast torque setpoint				x				
380	Flux calculation				x	x			x
381	Flux calculation						x	x	
382	Current setpoint						x	x	
390	Current controller				x	x	x	x	x
395	Motor model, frequency				x	x			x
396	Motor model, frequency						x	x	
400	Current limitation, V/f characteristic	x							
401	Current limitation, V/f characteristic with speed controller		x						
402	Current limitation, V/f characteristic textile			x					
405	V/f characteristic	x	x	x					
420	Gating unit	x	x	x	x	x	x	x	x
430	Temperature model				x	x	x	x	x
470	Braking control	x	x	x	x	x	x	x	x
480	Messages	x	x	x	x	x	x	x	x

Note:

n control = speed control with speed controller (P100=4)
f control = speed control without speed controller (P100=3)
T control = torque control (P100=5)

Changeover from master to slave drive is only possible with closed-loop control types P100 =3/4 closed-loop speed control **with/without** encoder (control word 2 bit 27 [190.5]).
The closed-loop control then operates as torque control (as P100 = 4).

Explanation of the symbols used in the function diagram

Parameter

r007 n007 — Display parameters

P123 U123 — Setting parameters

U345 (50,00)
0 ...120 % — Setting parameter, not indexed
(factory setting: 50.00 Range 0 ... 120%)

U345.3 — Setting parameter, indexed, index 3

U345.B — Setting parameter,
belongs to BiCo data set (2 indices)

U345.F — Setting parameter,
belongs to function data set (4 indices)

U345.M — Setting parameter,
belongs to the motor data set (16 indices)

Connectors/binectors

K0000 — Connector (freely interconnectable 16 bit signal; number representation:
100% corresponds to 4000hex;
corresponds to 16384dec)

KK0001 — Double connector (freely interconnectable 32 bit signal;
number representation:
100% corresponds to 40000000hex;
corresponds to 1073741824dec)

B0000 — Binector (freely interconnectable binary signal), can be output via digital output [90], [91], [92]

P531 (326)
K — Selection of any connector (factory setting: P531=326, i.e. connector K326 selected)
Place for entering the selected connector

P432 (546)
KK — Selection of any double connector (factory setting: P432=546, i.e. connector KK546 selected)

P597 (1)
B .01
B .02
B .03 — Selection of 3 binectors via indexed parameters (binector B001 is selected in the factory setting for all 3 outputs, i.e. fixed value "1", see below)

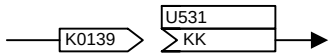
0 — B0000
1 — B0001

0% — K0000
100% (=16384) — K0001
200% (=32767) — K0002
-100% (=-16384) — K0003
-200% (=-32767) — K0004

0 — KK0000
100% (=1 073 741 824) — KK0001
200% (=2 147 483 647) — KK0002
-100% (=-1 073 741 824) — KK0003
-200% (=-2 147 483 647) — KK0004

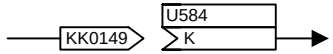
Automatic conversion between connectors and double connectors

Converting a connector to a double connector:



K139 is converted to a double connector by entering it in the high word of the double connector and by setting its low word to zero.

Converting a double connector to a connector:



KK149 is converted to a connector by entering its high word in the connector.

Cross references

[702.5] — The signal comes from / goes to sheet 702, signal path 5 of function diagram

Sampling time of the main processor

T0 = Basic sampling time = P357

Sampling time of the gating unit processor

Tp = n/fpuls ≥ 0.4 ms (n = 1 ... 7) fpulse = P340

e.g.

P340=2.5 kHz	n=1	Tp=0.4 ms
P340=4.0 kHz	n=2	Tp=0.5 ms

Indication of the block number and the sampling time for the free blocks

U953.14 = ___(xx) — The block has the number 314. The block can be activated via U953.14 and its sampling time selected (see sheet 702).

n959.02 = 7 — The block is permanently assigned to a sampling time

Calculating time of the free blocks

{8 µs} — Blocks of the indicated type require a typical calculating time of proximately 8 microseconds (rough guide value).

If the total available calculating time is exceeded, the monitoring system shown on sheet 702 will respond.

General visualization paramaters

- r001 Drive Status → K0249
- r002 Rot freq → KK0020
- r003 Output Volts → K0021
- r004 Output Amps → K0022
- r005 Output power → K0023
- r006 DC Bus Volts → K0025
- r007 Motor Torque → K0024
- r008 Motor Utilization → K0244
- r009 Motor Tmp → K0245
- r010 Drive Utilization → K0246
- r069 SW Version
- r828 SW ID
- r001 Drive Status

0: MRPD Input
4: H/W Setting
5: System Set
7: Fault
8: ON locked
9: Rdy ON
10: Precharging
11: Ready for Operation
12: Ground fault test
13: "Flying restart" function active
14: Operation
15: OFF 1
16: OFF 3
17: "DC braking" active
18: Mot ID
19: Speed controller opt.
20: "Synchronization" function active
21: Download

- r014 Setp Speed → KK0150
- r015 n(act) → KK0020
- Menu Select P060

0: User param
1: M:Parameter
2: M:Fixed Set
3: M:Quick Startup
4: Board Def
5: Drive Setting
6: Download
7: UpR/fr access
8: M:Power Def

Pxxx.M ⇒ Motor data set parameter (4 indices)
Switchover by control word bit 18/19 [190/2]

act. MotDataSet (Motor-Daten-Satz) r011 → K0034

Pxxx.B ⇒ BiCo - Data set parameter (2 indices)
(corresponds to the basic/reserve data set)
Switchover by control word bit 30 [190/2]

Active BICO DSet r012 → K0035

Pxxx.F ⇒ Function data set parameter (4 indices)
(corresponds to the setpoint data set)
Switchover by control word bits 16 / 17 [190/2]

Active FuncDSet r013 (Function Data Set) → K0036

Normalization variables for closed-loop and open-loop control of the unit or the equipment (4000 (0000)Hex = 100 % of the base value)

P350 (~):	Ref Amps	(0.0 ... 6553.5 A)	
P351 (~):	Ref Volts	(100 ... 2000 V)	(also for DC link voltages)
P352 (50):	Ref Frequency	(4.00 ... 600.00 Hz)	
P353 (1500):	Ref Speed	(1 ... 36000 1/min)	
P354 (~):	Ref Torque	(0.10 ... 900 000.00 Nm)	(with P113 = Rated motor torque)
	Ref Tmp	256 °C	
	Ref power	P353 x P354 x 2 Pi / 60	(with P113 = Rated motor torque)
	Ref angle	90°	(0° = 360°, 0 % = 400 %)

Physical size in A, V, Hz, 1/min, °C, ° → $\frac{4000(0000)Hex}{RefParameter}$ → Process quantity with normalization 4000 (0000)Hex = 100 %

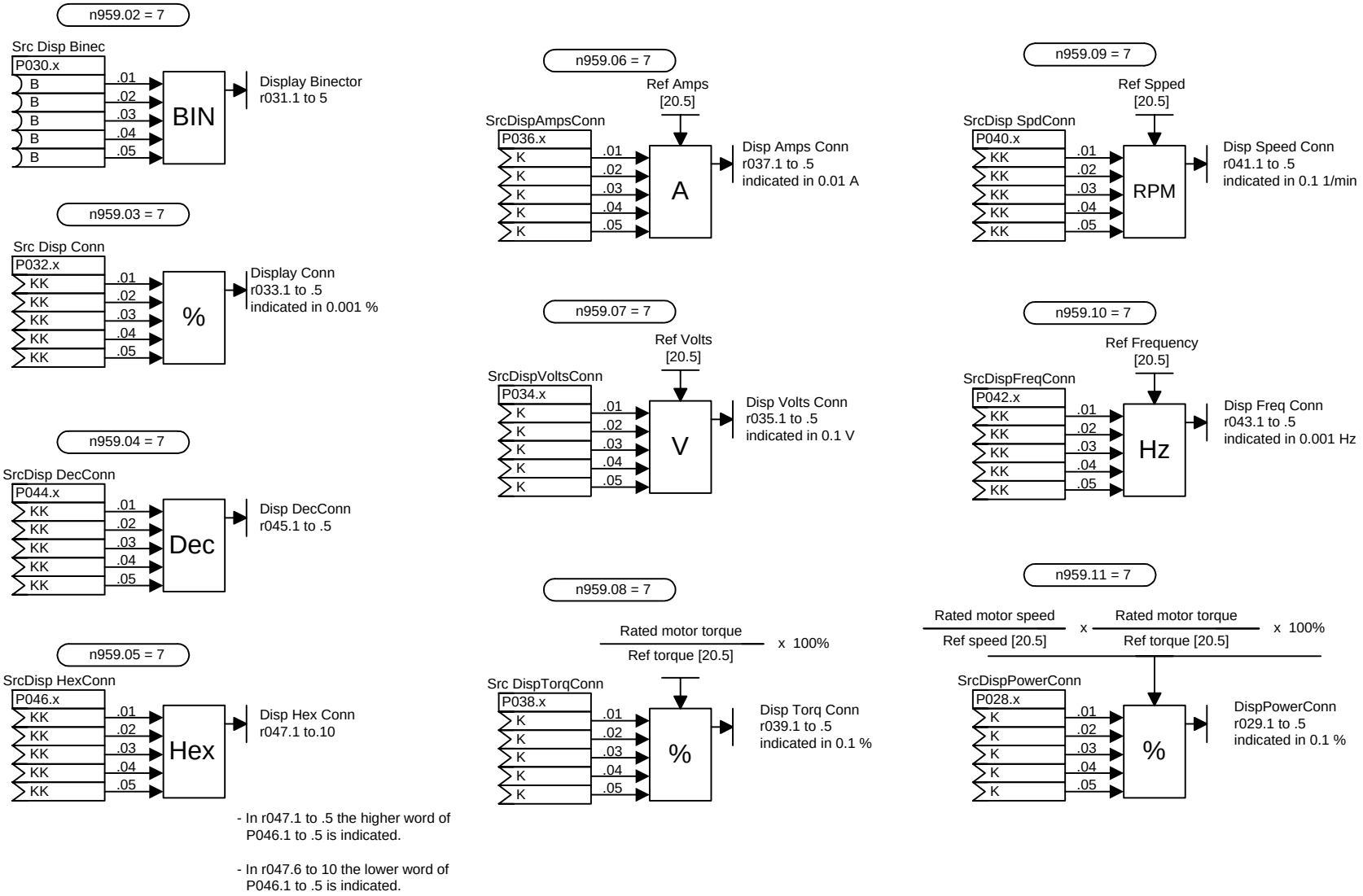
Torque and output in % → Motor Torque $\frac{4000Hex}{100\%} \cdot \frac{P113}{P354} \cdot \frac{P108}{P353}$ → 4000 (0000)Hex = 100 %

Notes:

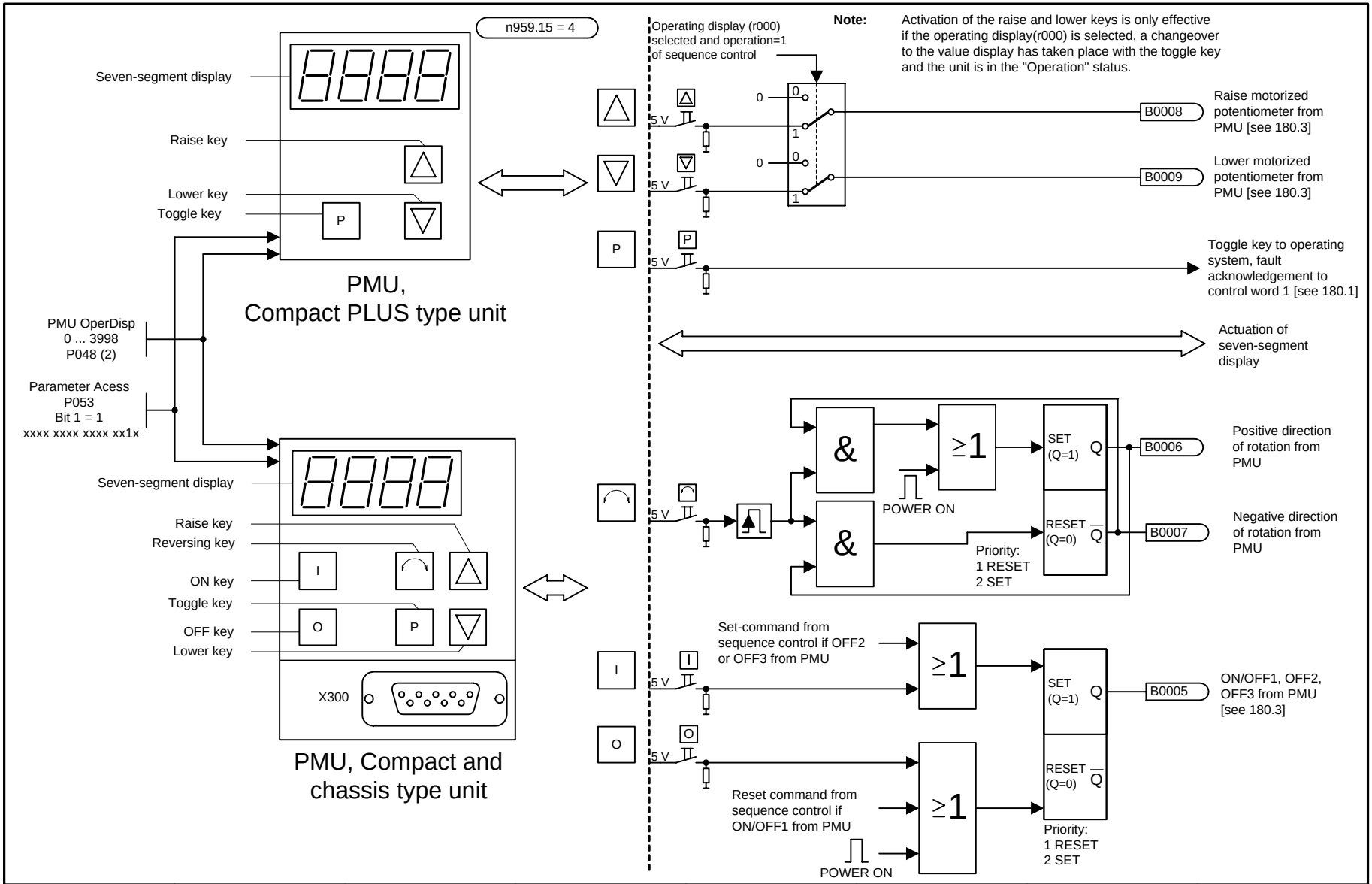
1. Both the limit values of the control (e.g. speed, torque, current) and the normalizations of the internal and external setpoint and actual-value data are influenced.

2. When calculation of the motor model (P115) is selected, the values are pre-assigned to motor rated quantities (only in converter status r001=5).

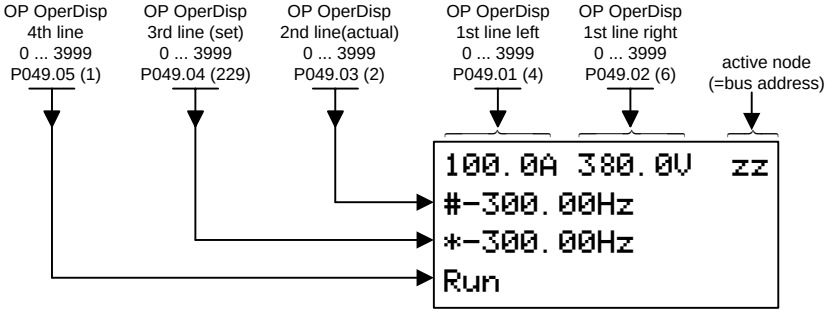
3. The listed parameter values can only be changed in the "Drive setting" menu (P060 = 5).



1	2	3	4	5	6	7	8
General functions					fp_vc_030_e.vsd	Function diagram	- 30 -
Free display parameters					31.01.98	MASTERDRIVES VC	



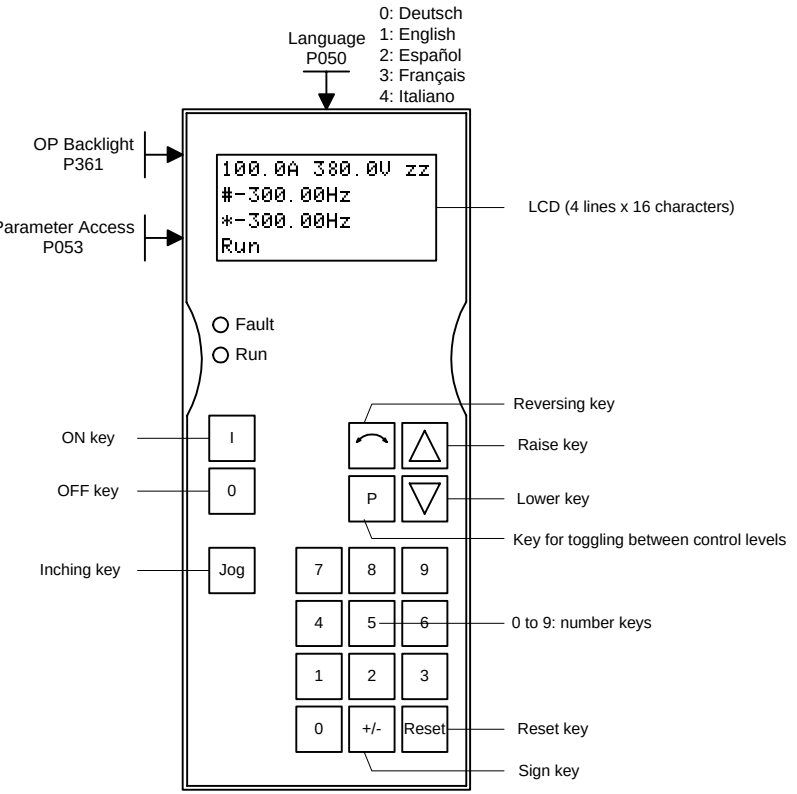
1	2	3	4	5	6	7	8
PMU					fp_vc_050_e.vsd	Function diagram	- 50 -
Keypad, functionality and wiring					16.05.01	MASTERDRIVES VC	



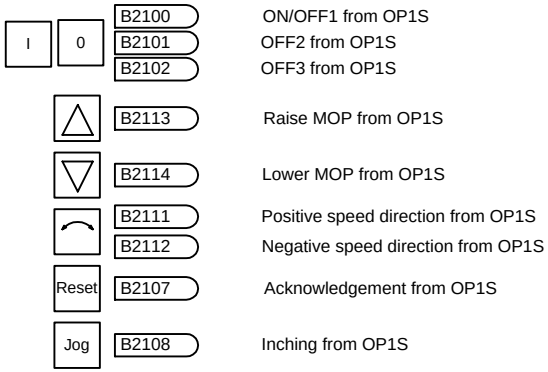
- A maximum of 6 characters (value + unit) are available for the display P049.01 und P049.02 respectively.

- The 2nd line (P049.03) is provided for displaying actual values.
- The 3rd line (P049.04) is provided for displaying setpoint values.

- To enable the setpoint to be changed in the operating display, its parameter number must be entered there. :
  e. g. P049.04 = 405 = Fixed setpoint 5



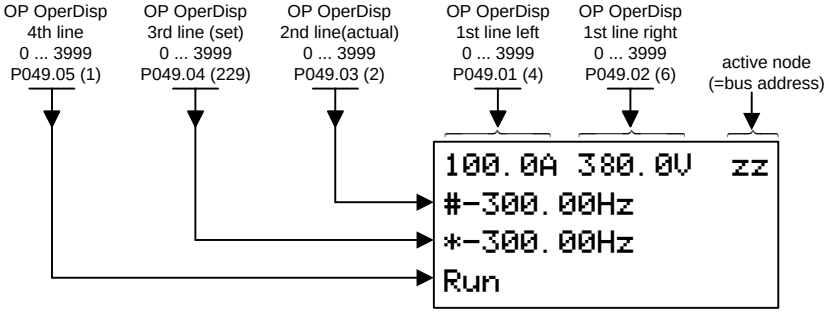
The control commands are transferred via word 1 in the USS protocol.



See connection to control word [180.3]

Not valid for Compact PLUS

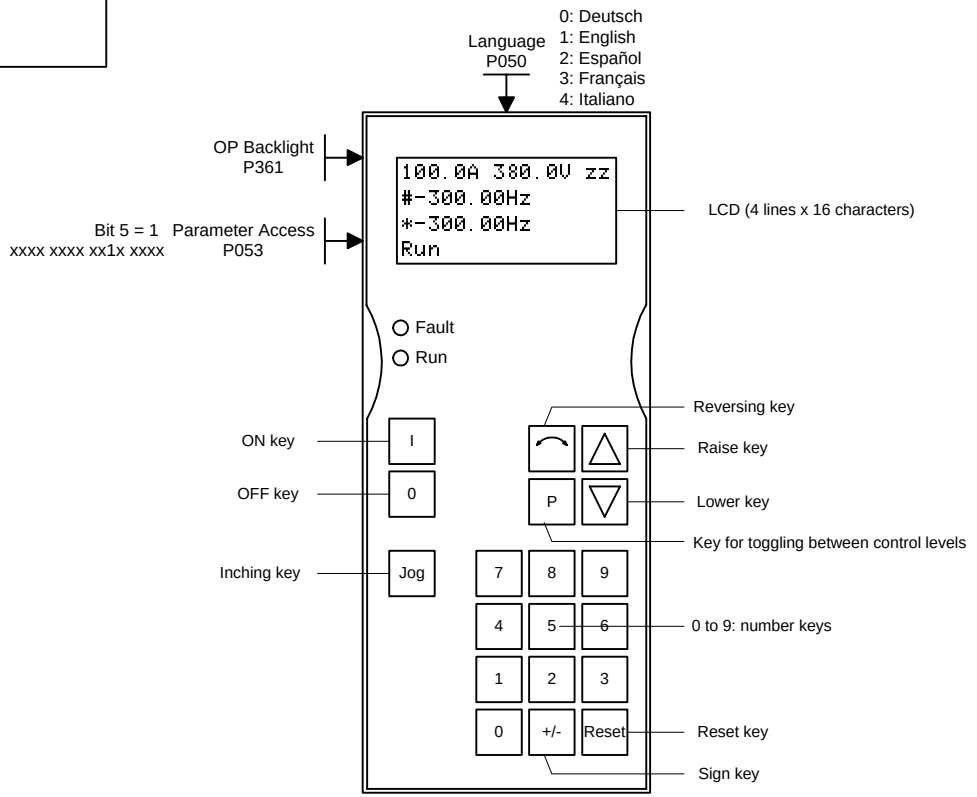
1	2	3	4	5	6	7	8
OP1S					fp_vc_060_e.vsd	Function diagram	- 60 -
Operating display					24.07.01	MASTERDRIVES VC	



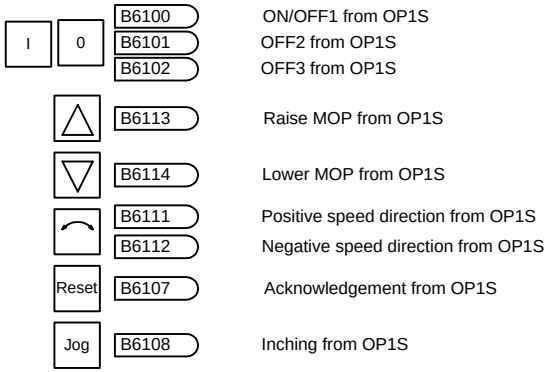
- A maximum of 6 characters (value + unit) are available for the display P049.01 und P049.02 respectively.

- The 2nd line (P049.03) is provided for displaying actual values.
- The 3rd line (P049.04) is provided for displaying setpoint values.

- To enable the setpoint to be changed in the operating display, its parameter number must be entered there. :
  e. g. P049.04 = 405 = Fixed setpoint 5

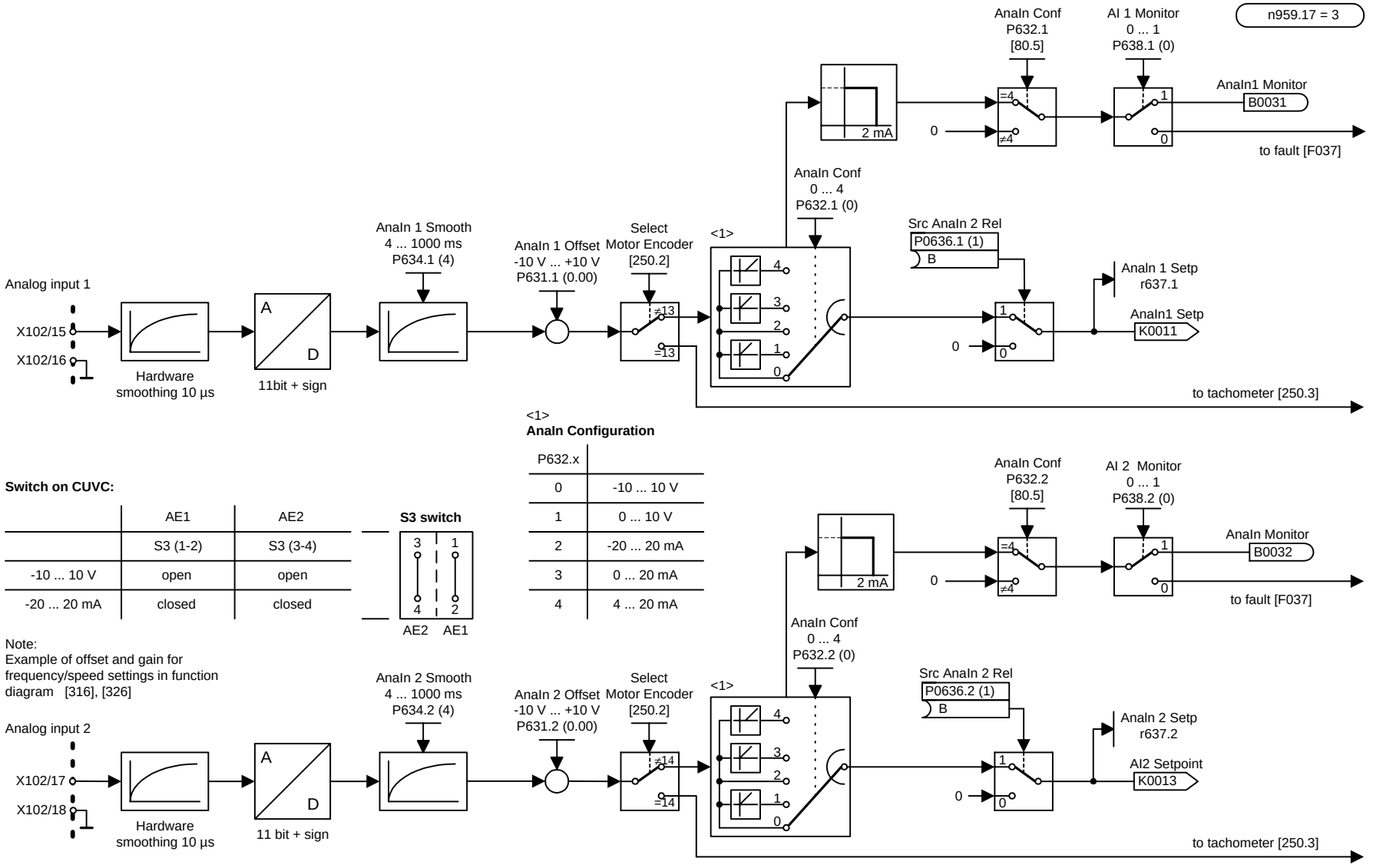


The control commands are transferred via word 1 in the USS protocol.

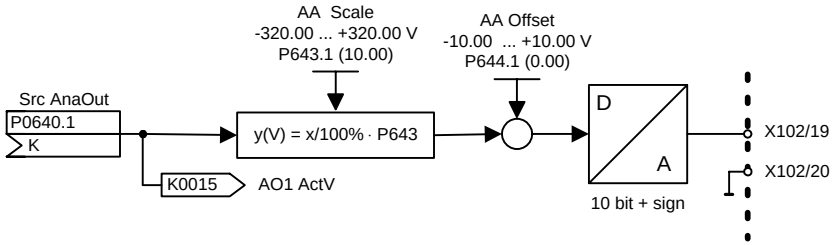


See connection to control word [180.3]

1	2	3	4	5	6	7	8
OP1S; type Compact PLUS					fp_vc_061_e.vsd	Function diagram	- 61 -
Operating display					24.07.01	MASTERDRIVES VC	


n959.17 = 3
AnaIn Conf
P632.1
[80.5]
AI 1 Monitor
0 ... 1
P638.1 (0)
AnaIn1 Monitor
B0031
2 mA
to fault [F037]
AnaIn Conf
0 ... 4
P632.1 (0)
Src AnaIn 2 Rel
P0636.1 (1)
B
Analog input 1
X102/15
X102/16
Hardware
smoothing 10 µs
11bit + sign
AnaIn 1 Smooth
4 ... 1000 ms
P634.1 (4)
AnaIn 1 Offset
-10 V ... +10 V
P631.1 (0.00)
Select
Motor Encoder
[250.2]
AnaIn 1 Setp
r637.1
AnaIn1 Setp
K0011
to tachometer [250.3]
<1>
AnaIn Configuration
P632.x
0 -10 ... 10 V
1 0 ... 10 V
2 -20 ... 20 mA
3 0 ... 20 mA
4 4 ... 20 mA
Switch on CUVC:
AE1 AE2
S3 (1-2) S3 (3-4)
-10 ... 10 V open open
-20 ... 20 mA closed closed
S3 switch
AE2 AE1
AnaIn Conf
P632.2
[80.5]
AI 2 Monitor
0 ... 1
P638.2 (0)
AnaIn Monitor
B0032
to fault [F037]
AnaIn Conf
0 ... 4
P632.2 (0)
Src AnaIn 2 Rel
P0636.2 (1)
B
Note:
Example of offset and gain for
frequency/speed settings in function
diagram [316], [326]
Analog input 2
X102/17
X102/18
Hardware
smoothing 10 µs
11 bit + sign
AnaIn 2 Smooth
4 ... 1000 ms
P634.2 (4)
AnaIn 2 Offset
-10 V ... +10 V
P631.2 (0.00)
Select
Motor Encoder
[250.2]
AnaIn 2 Setp
r637.2
AI2 Setpoint
K0013
to tachometer [250.3]

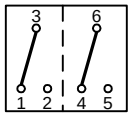
n959.19 = 3

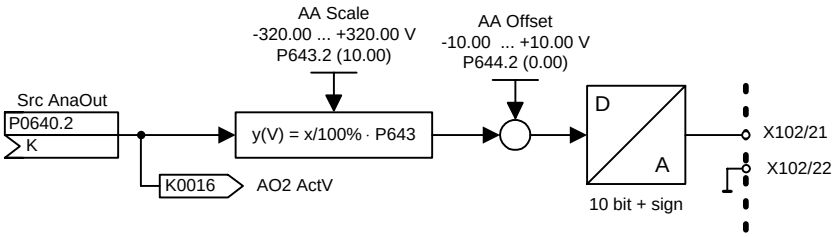


Switch on CUVC:

A01	
S4 (1-3)	-10 ... 10 V
S4 (2-3)	20 ... 0 mA

S4 switch





Switch on CUVC:

A02	
S4 (4-6)	-10 ... 10 V
S4 (5-6)	20 ... 0 mA

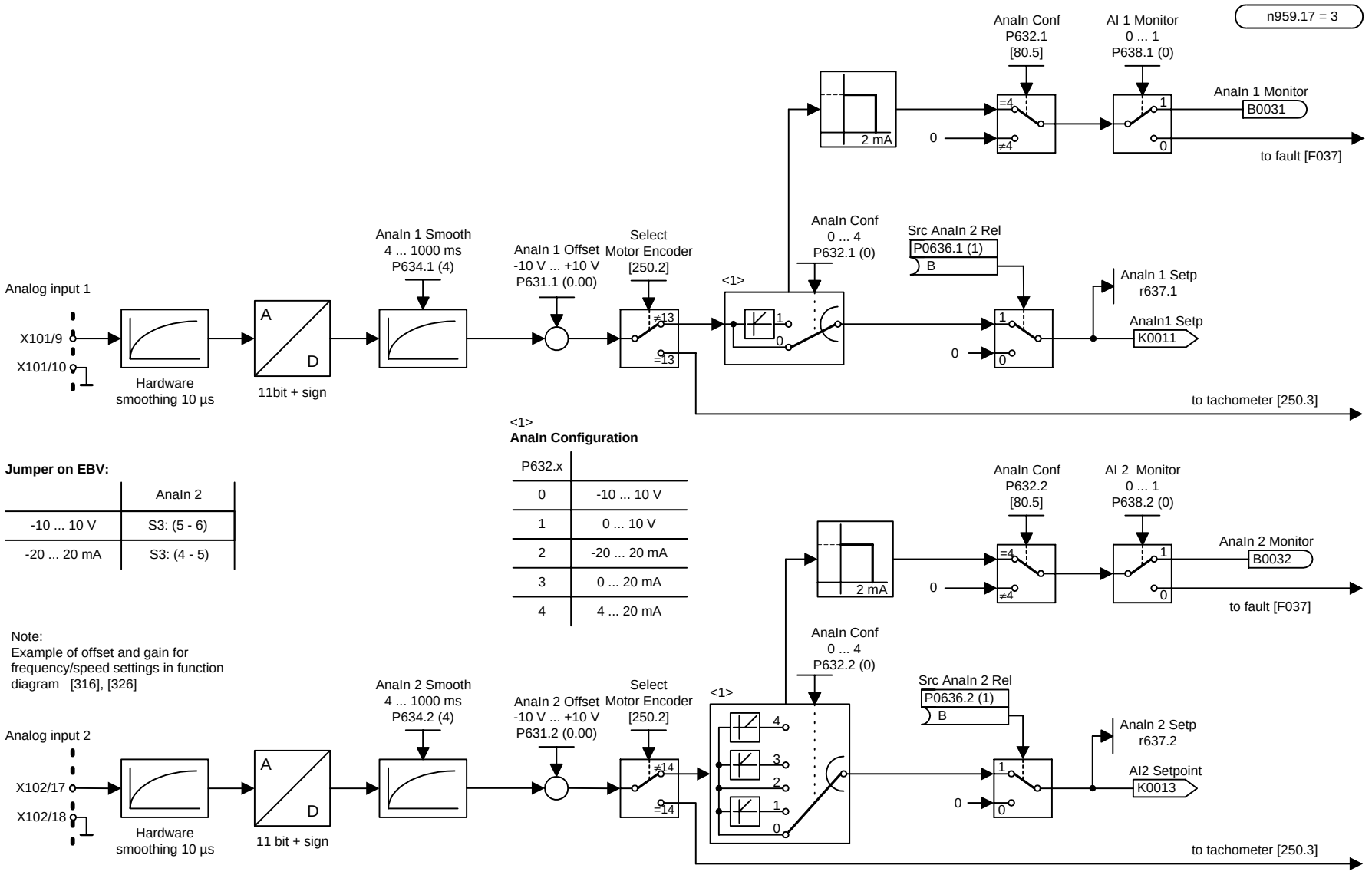
Notes on settings:
B = Base value (compare P350 ... P354)
S_{min} = Smallest signal value (e.g. in Hz, V, A)
S_{max} = Largest signal value (e.g. in Hz, V, A)
A_{min} = Smallest output value inV
A_{max} = Largest output value in V

Output values in the case of current output:
4 mA ⇒ A_{min} = + 6 V
20 mA ⇒ A_{max} = - 10 V

$$P643 = \frac{A_{max} - A_{min}}{S_{max} - S_{min}} \times B$$

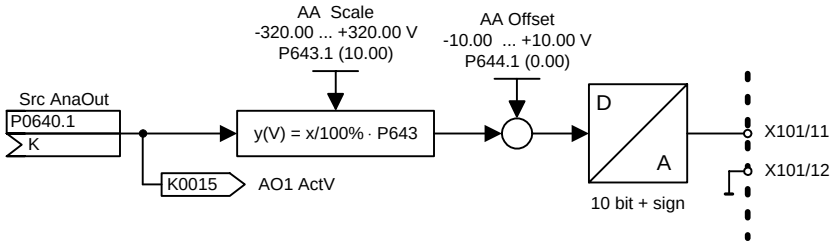
$$P644 = \frac{A_{max} + A_{min}}{2} - P643 \frac{S_{max} - S_{min}}{2 \times B}$$

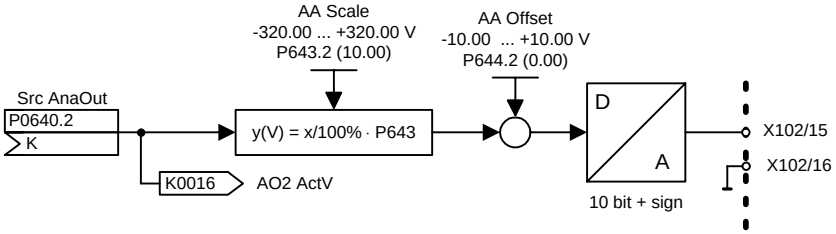
$$P644 = \frac{A_{min} * S_{max} - A_{max} * S_{min}}{S_{max} - S_{min}}$$



1	2	3	4	5	6	7	8
CUVC terminals; type Compact PLUS					fp_vc_082_e.vsd	Function diagram	- 82 -
Analog inputs, voltage and current specification					24.07.01	MASTERDRIVES VC	

n959.19 = 3





Jumper on EBV:

A02	
S4 (1-2)	-10 ... 10 V
S4 (2-3)	20 ... 0 mA

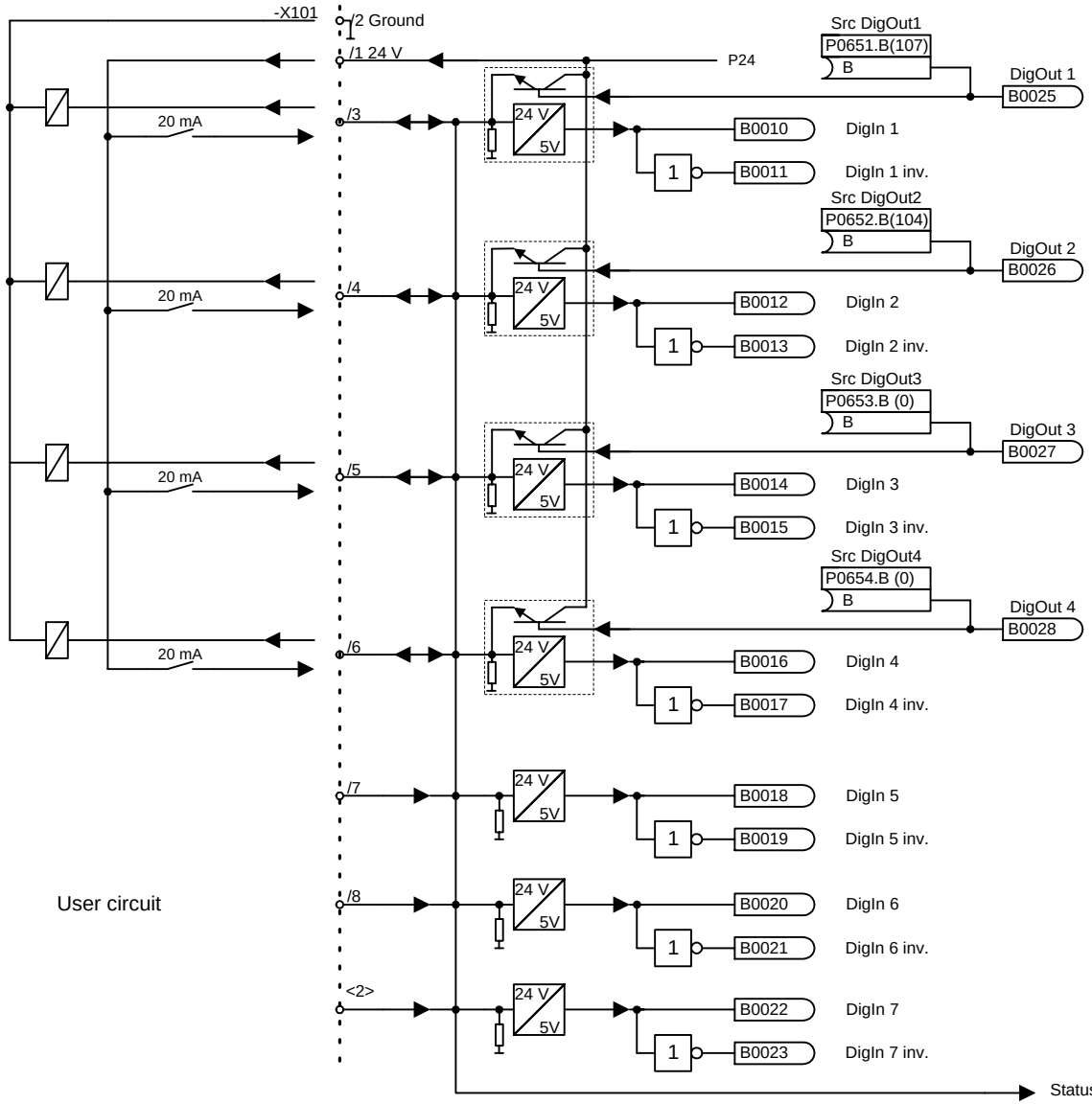
Notes on settings:
B = Base value (compare P350 ... P354)
S_{min} = Smallest signal value (e.g. in Hz, V, A)
S_{max} = Largest signal value (e.g. in Hz, V, A)
A_{min} = Smallest output value inV
A_{max} = Largest output value in V

Output values in the case of current output:
4 mA ⇒ A_{min} = + 6 V
20 mA ⇒ A_{max} = - 10 V

$$P643 = \frac{A_{max} - A_{min}}{S_{max} - S_{min}} \times B$$

$$P644 = \frac{A_{max} + A_{min}}{2} - P643 \frac{S_{max} - S_{min}}{2 \times B}$$

$$P644 = \frac{A_{min} * S_{max} - A_{max} * S_{min}}{S_{max} - S_{min}}$$



Inputs U950.13 = ___(4)

Outputs U950.23 = ___(4)

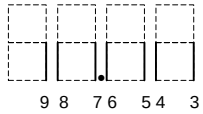
The terminals -X101/3 to -X101/6 can be used as digital inputs or digital outputs.

If they are used as digital inputs, the parameters P651.B, P652.B, P653.B and P654.B have to be set to 0.

If they are used as digital outputs, B010 ... B017 must not be used.

The terminals -X101/7 to -X101/9 (X102/19) can **only** be used as digital inputs.

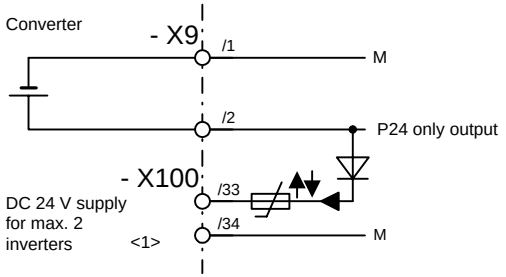
<1> Signal status display for digital input/output terminals on the PMU in r646:

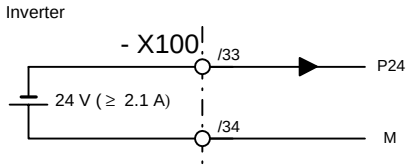


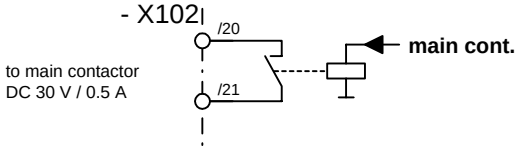
<2> Compact/Chassis type unit: terminal X101/9

type Compact PLUS: terminal X102/19

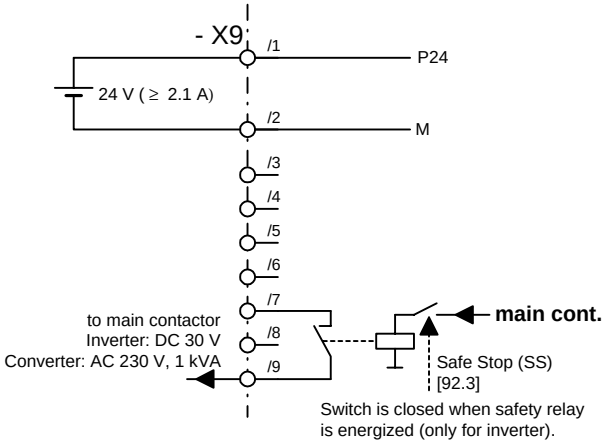
Compact PLUS type unit



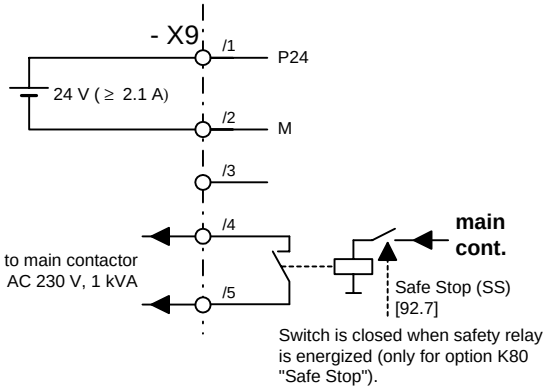


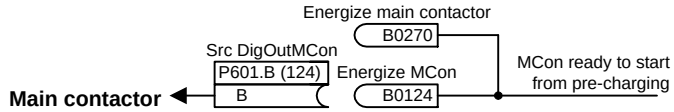


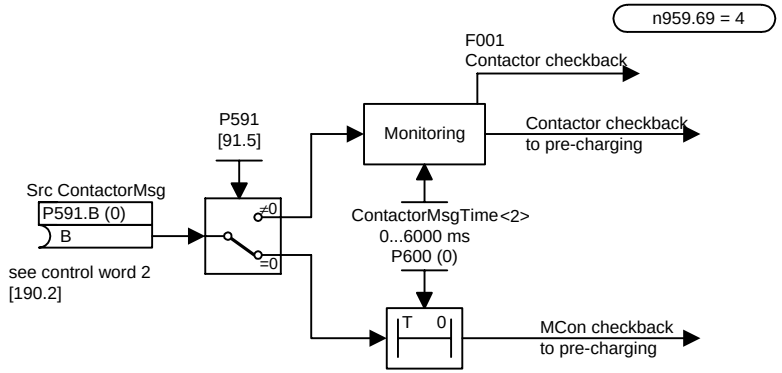
Compact type unit



Chassis type unit



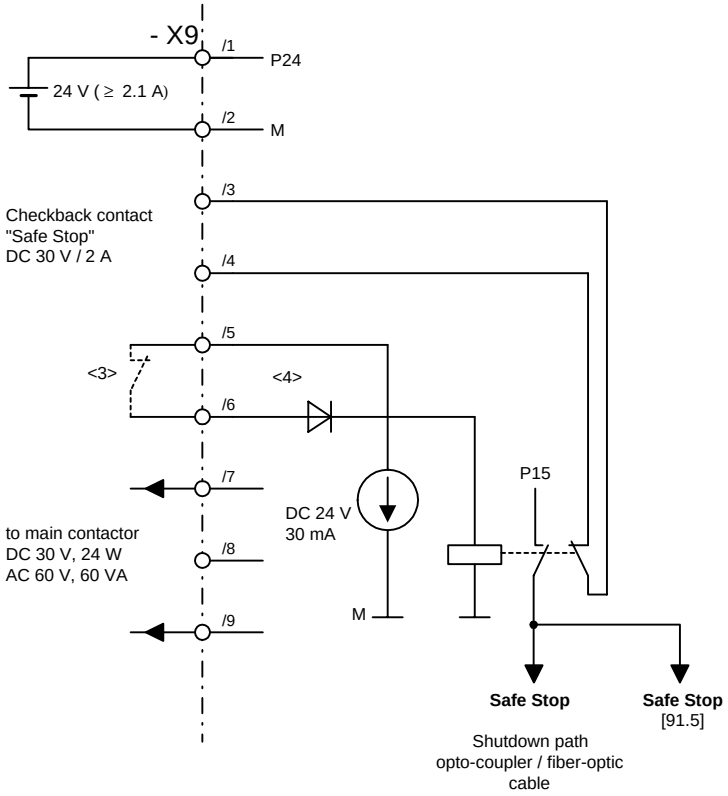




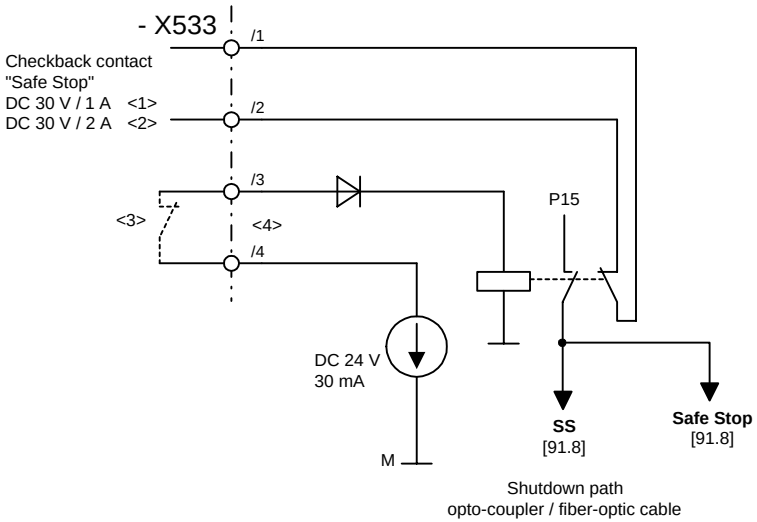
<1> For 0.75 kW converter only one inverter

<2> A value of approx. 500 ms is recommended as the main contactor checkback time

Compact type unit
(only inverter)

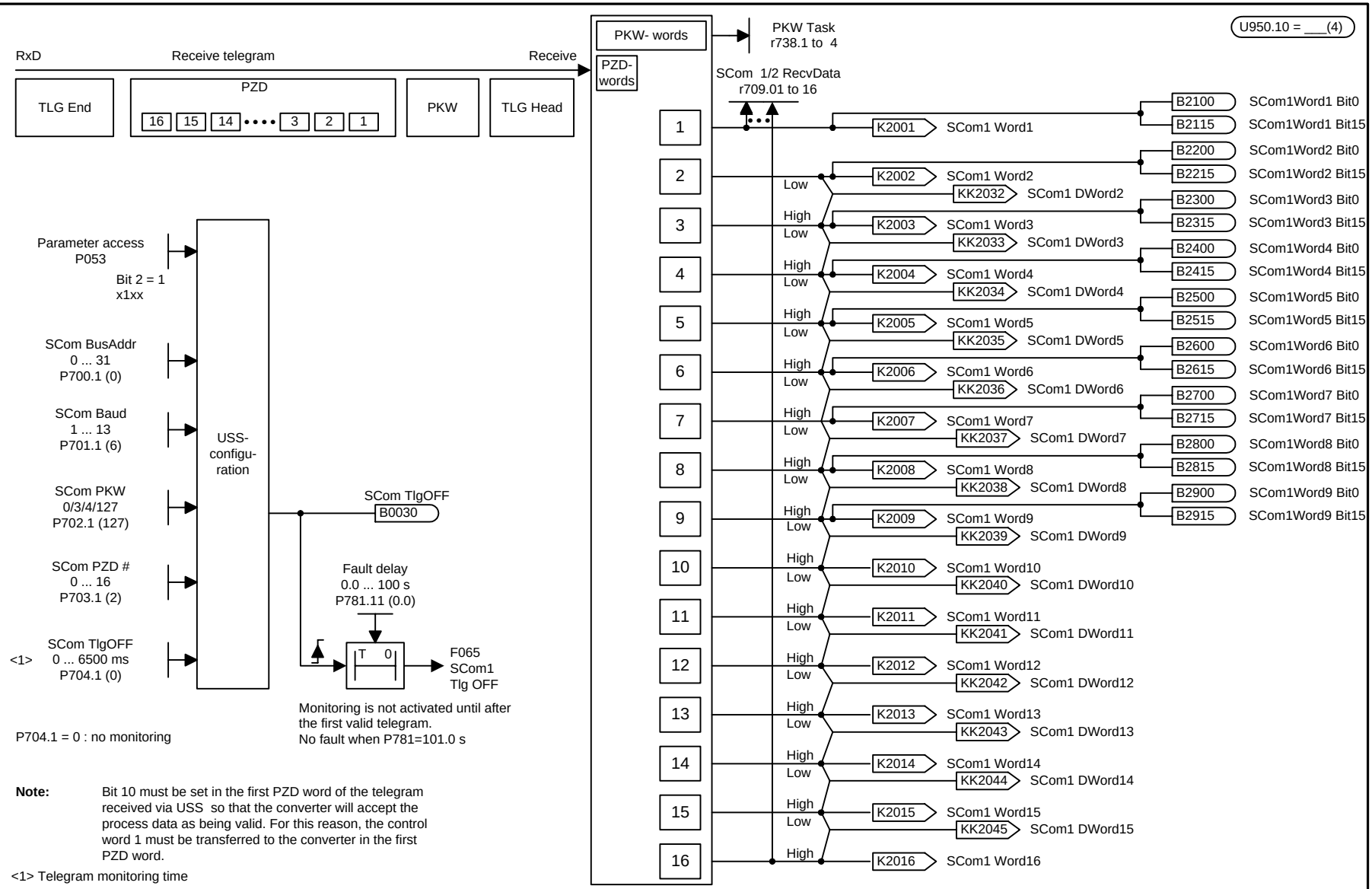


Compact PLUS type unit <1>
Chassis type unit <2>



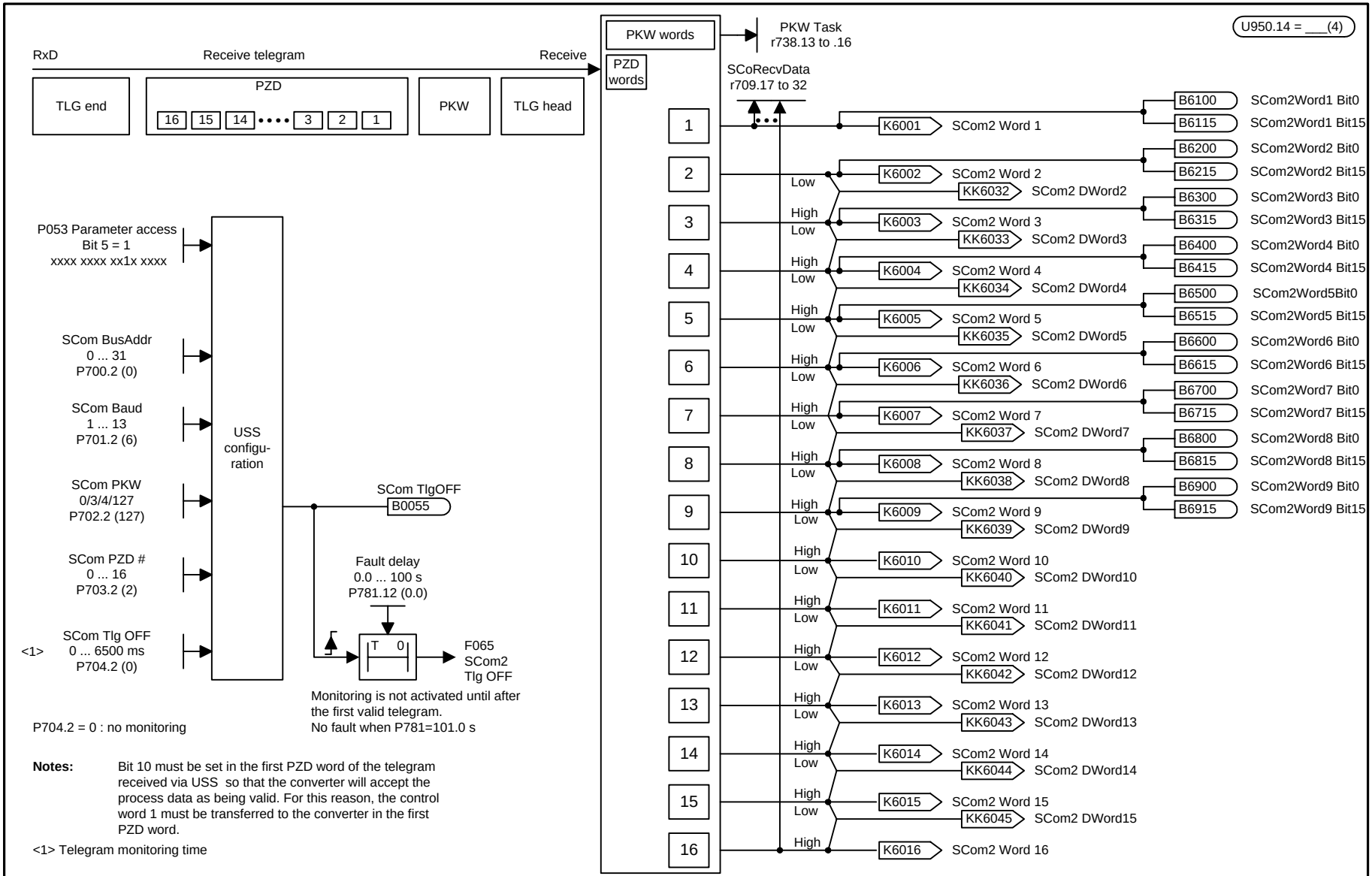
<3> Safety switch "Safe Stop" active when switch is open

<4> results in OFF2 [180.2]



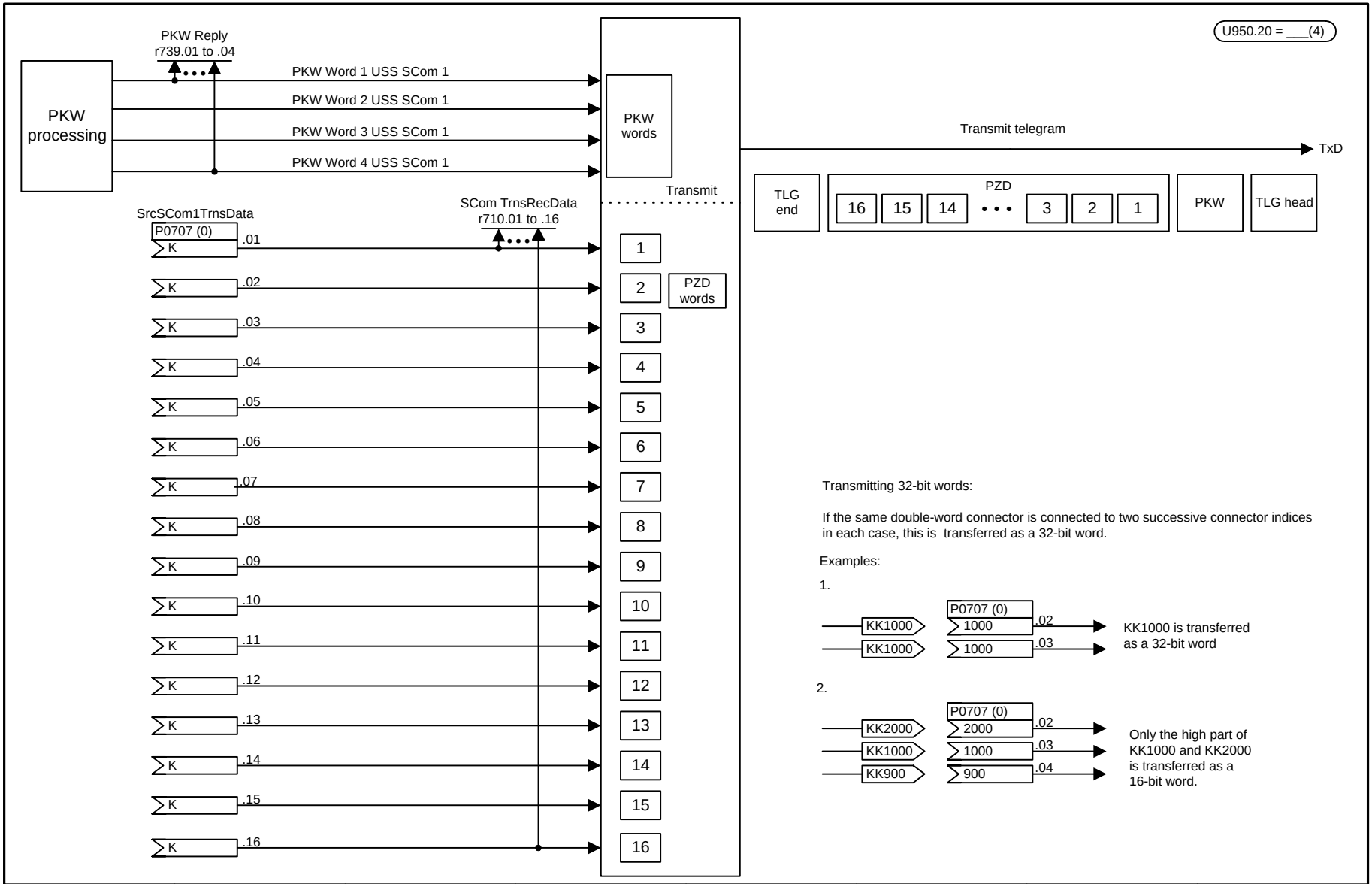
Note: Bit 10 must be set in the first PZD word of the telegram received via USS so that the converter will accept the process data as being valid. For this reason, the control word 1 must be transferred to the converter in the first PZD word.

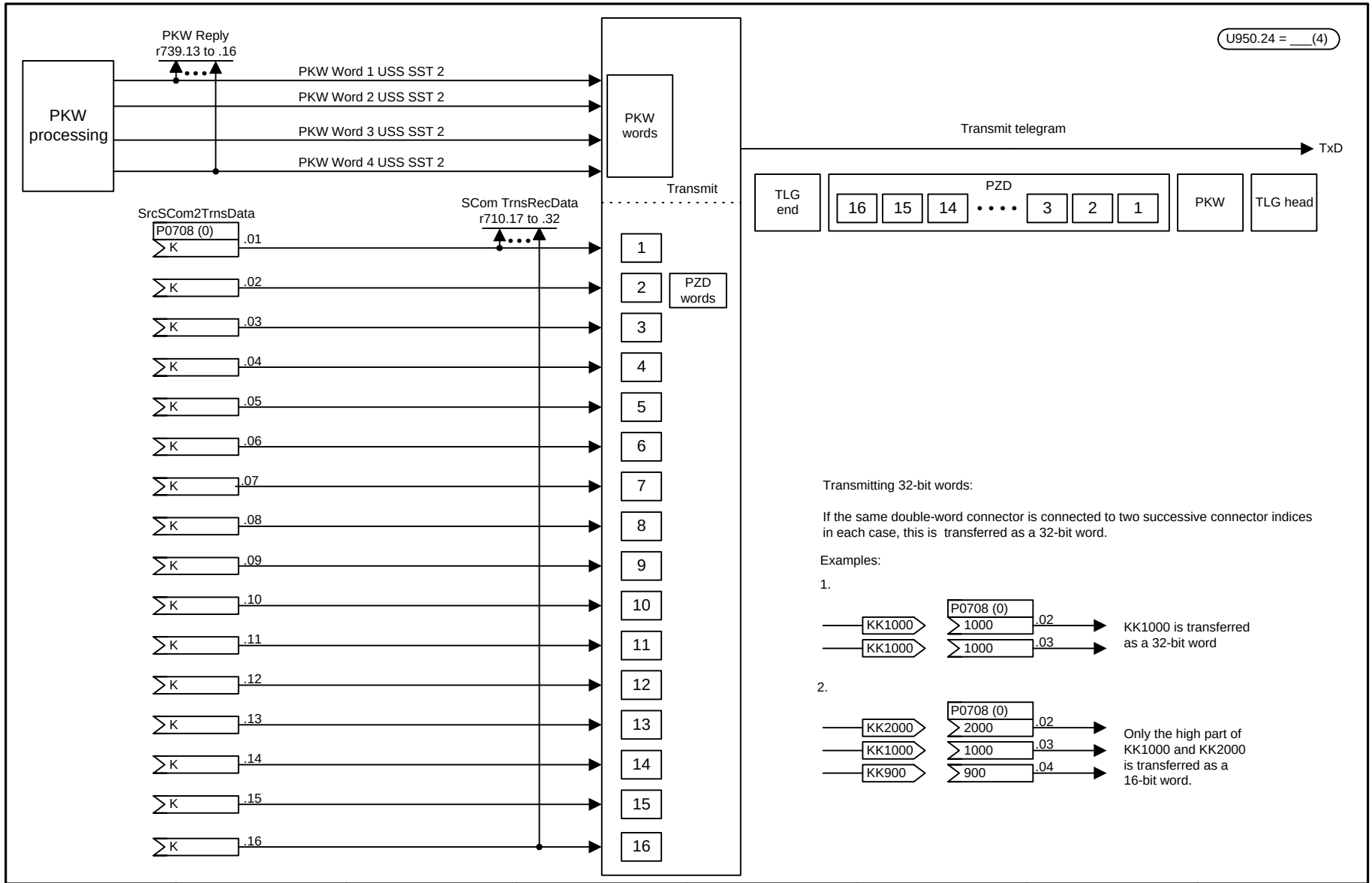
<1> Telegram monitoring time

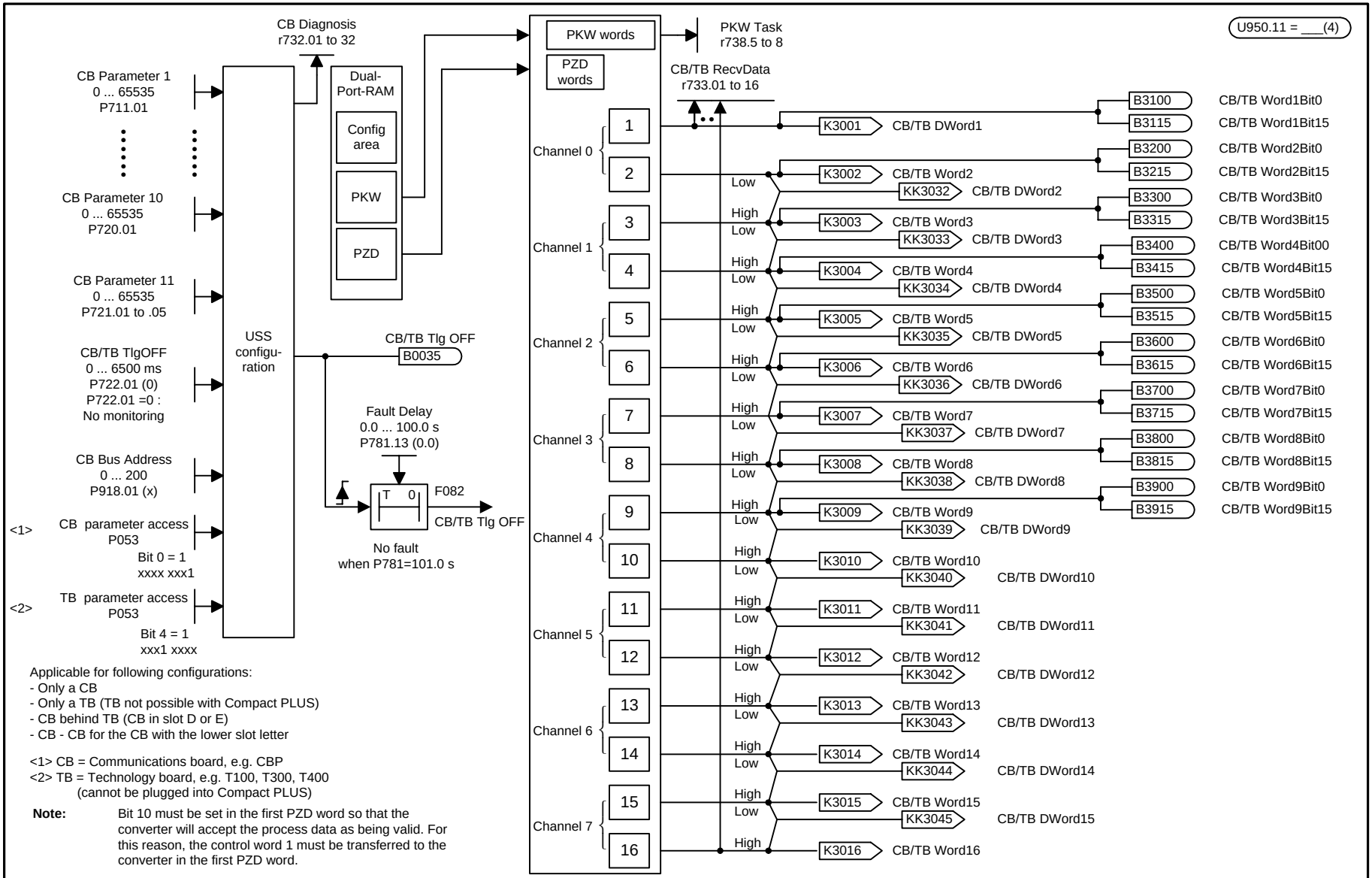


Notes: Bit 10 must be set in the first PZD word of the telegram received via USS so that the converter will accept the process data as being valid. For this reason, the control word 1 must be transferred to the converter in the first PZD word.

<1> Telegram monitoring time


PKW Reply
r739.01 to .04
PKW processing
PKW Word 1 USS SCom 1
PKW Word 2 USS SCom 1
PKW Word 3 USS SCom 1
PKW Word 4 USS SCom 1
PKW words
Transmit
SCom TrnsRecData
r710.01 to .16
SrcSCom1TrnsData
P0707 (0)
K
.01
.02
.03
.04
.05
.06
.07
.08
.09
.10
.11
.12
.13
.14
.15
.16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
PZD words
U950.20 = ___(4)
Transmit telegram
TxD
TLG end
PZD
16
15
14
3
2
1
PKW
TLG head
Transmitting 32-bit words:
If the same double-word connector is connected to two successive connector indices in each case, this is transferred as a 32-bit word.
Examples:
1.
KK1000
KK1000
P0707 (0)
1000
1000
.02
.03
KK1000 is transferred as a 32-bit word
2.
KK2000
KK1000
KK900
P0707 (0)
2000
1000
900
.02
.03
.04
Only the high part of KK1000 and KK2000 is transferred as a 16-bit word.

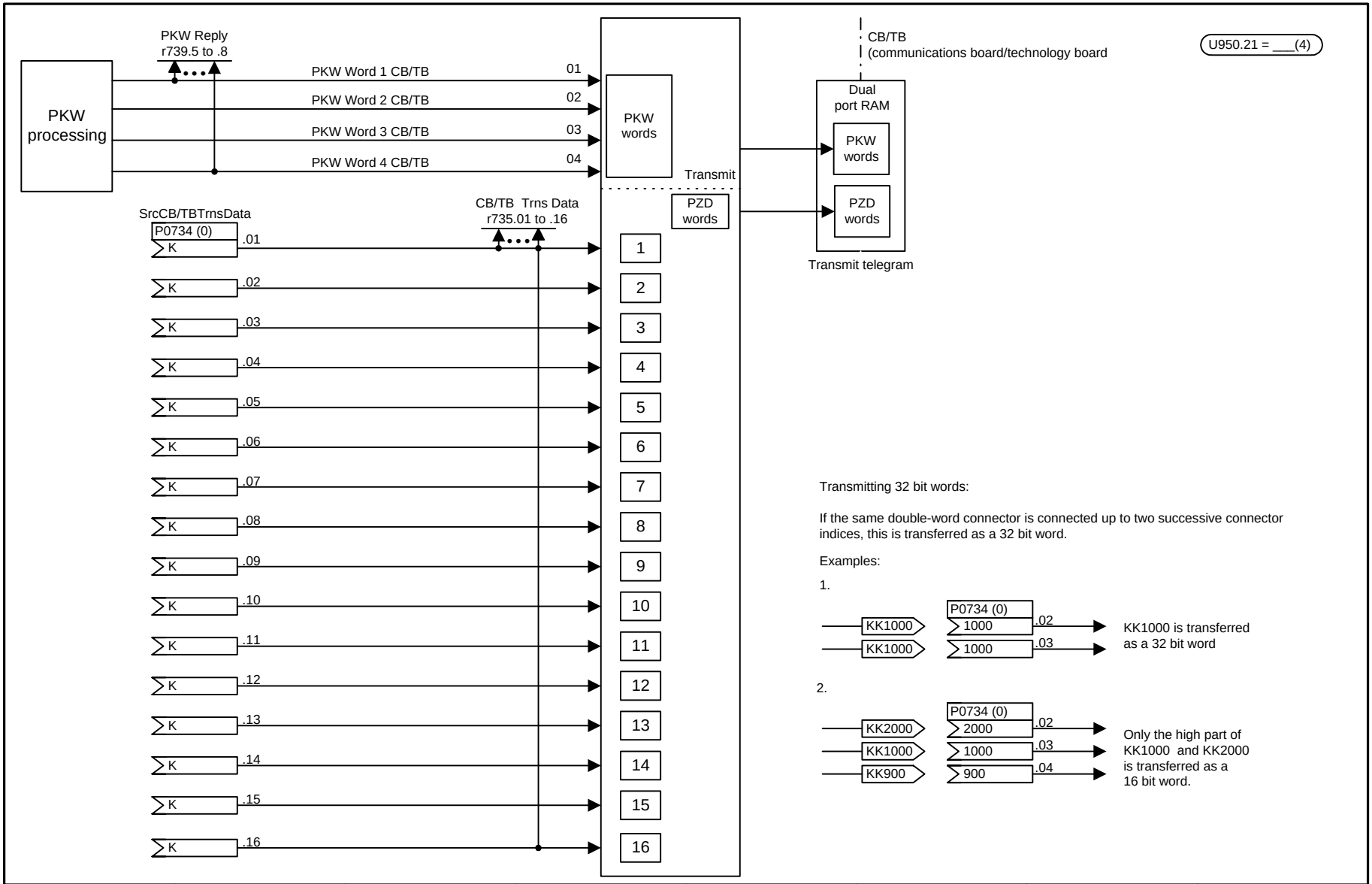

PKW Reply
r739.13 to .16
PKW processing
PKW Word 1 USS SST 2
PKW Word 2 USS SST 2
PKW Word 3 USS SST 2
PKW Word 4 USS SST 2
PKW words
Transmit
SCom TrnsRecData
r710.17 to .32
SrcSCom2TrnsData
P0708 (0)
K
.01
.02
.03
.04
.05
.06
.07
.08
.09
.10
.11
.12
.13
.14
.15
.16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
PZD words
U950.24 = ___(4)
Transmit telegram
TxD
TLG end
PZD
16
15
14
3
2
1
PKW
TLG head
Transmitting 32-bit words:
If the same double-word connector is connected to two successive connector indices in each case, this is transferred as a 32-bit word.
Examples:
1.
KK1000
KK1000
P0708 (0)
1000
1000
.02
.03
KK1000 is transferred as a 32-bit word
2.
KK2000
KK1000
KK900
P0708 (0)
2000
1000
900
.02
.03
.04
Only the high part of KK1000 and KK2000 is transferred as a 16-bit word.



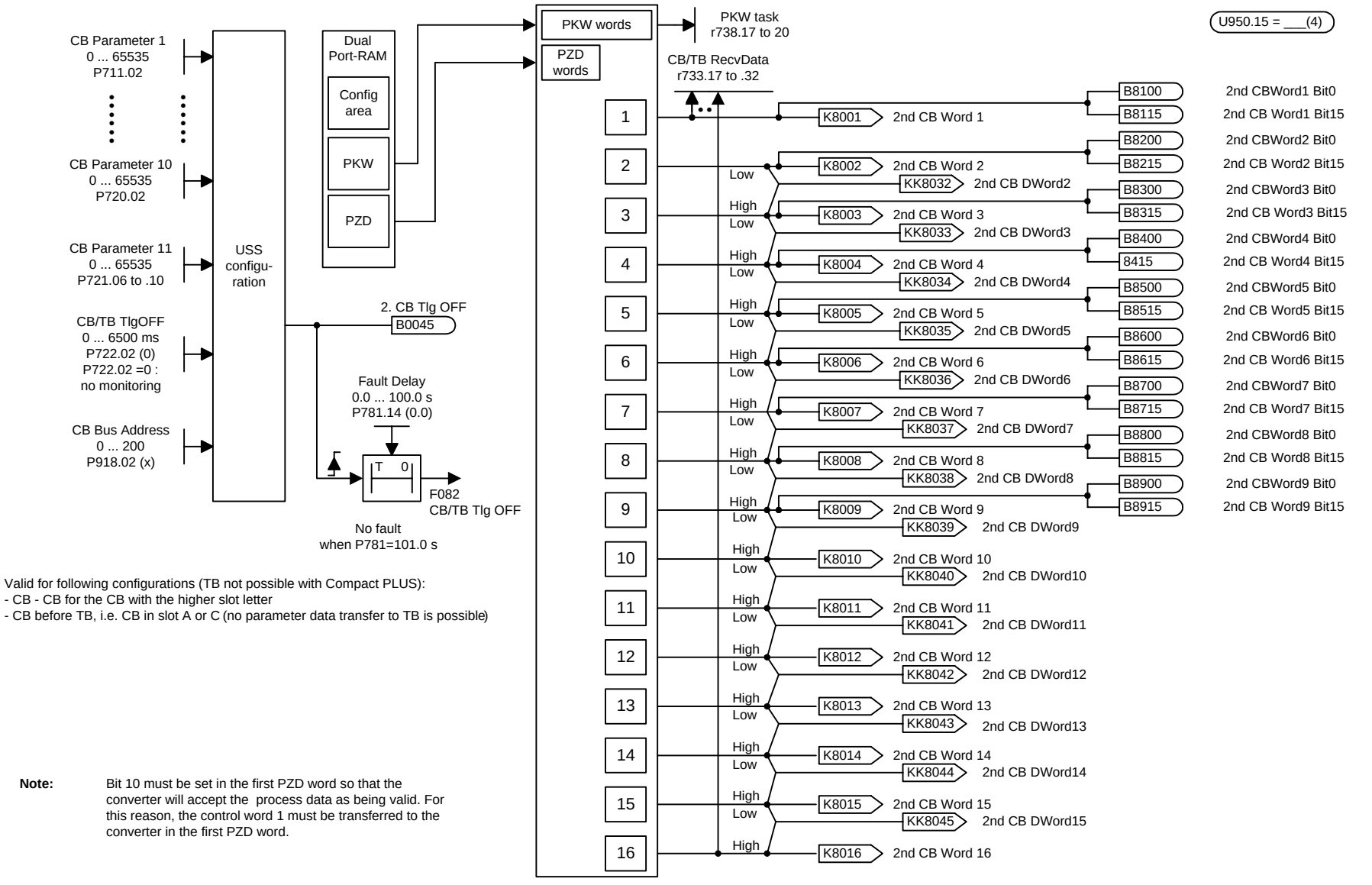
Applicable for following configurations:
- Only a CB
- Only a TB (TB not possible with Compact PLUS)
- CB behind TB (CB in slot D or E)
- CB - CB for the CB with the lower slot letter

<1> CB = Communications board, e.g. CBP
<2> TB = Technology board, e.g. T100, T300, T400
(cannot be plugged into Compact PLUS)

Note: Bit 10 must be set in the first PZD word so that the converter will accept the process data as being valid. For this reason, the control word 1 must be transferred to the converter in the first PZD word.

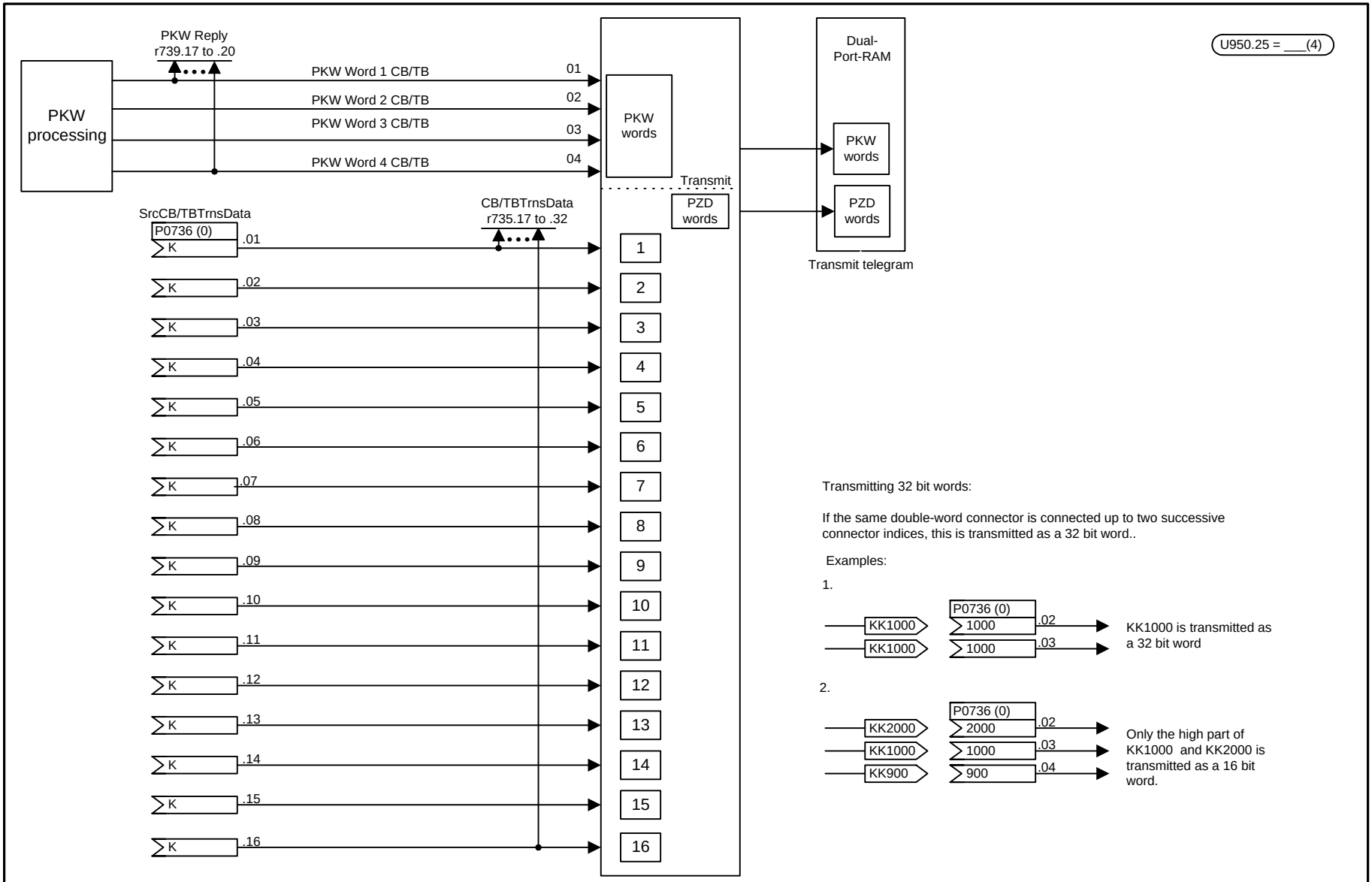


1	2	3	4	5	6	7	8
First CB/TB board (low slot letter)					fp_vc_125_e.vsd	Function diagram	- 125 -
Transmitting					27.10.00	MASTERDRIVES VC	

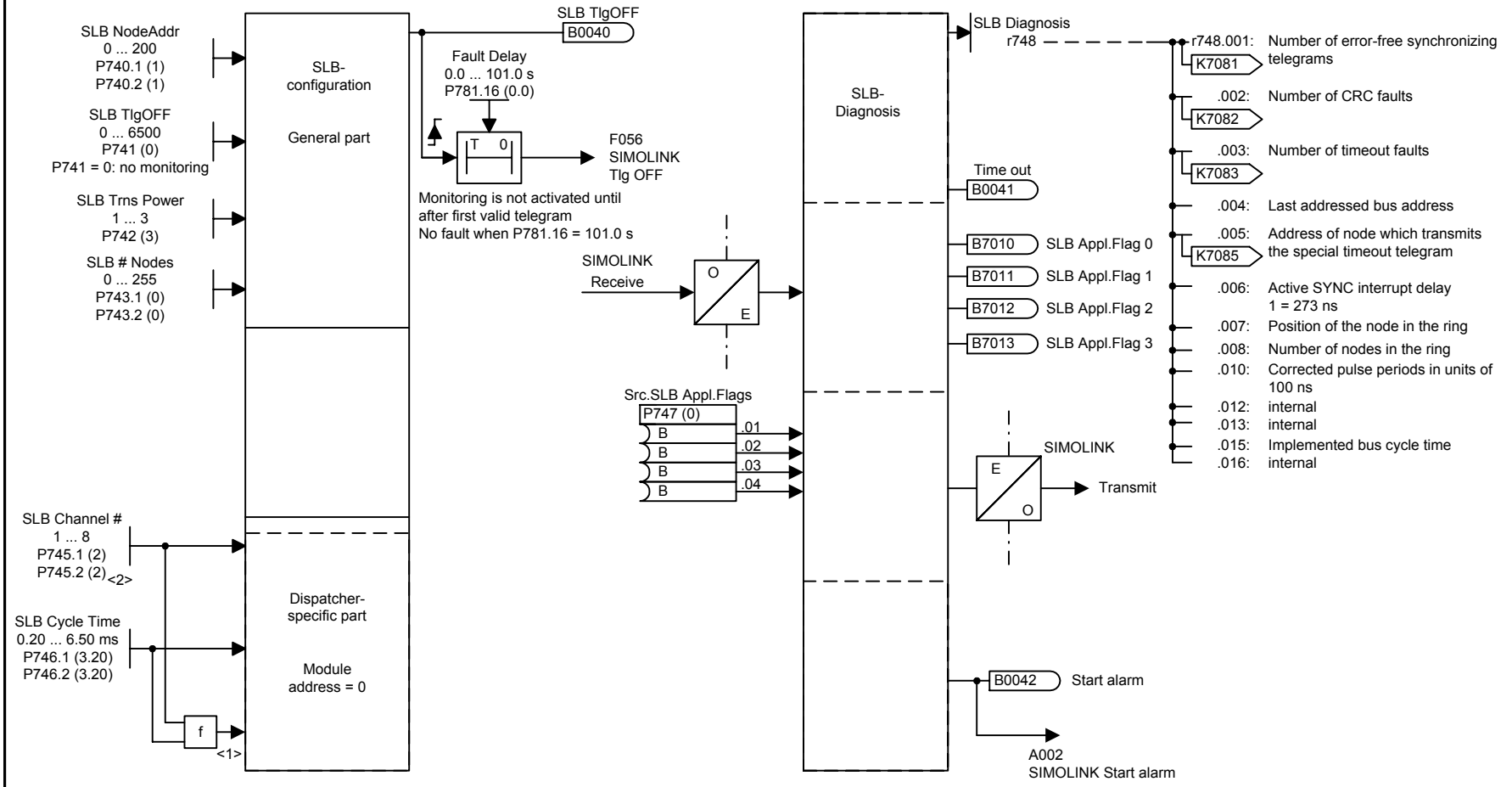


Valid for following configurations (TB not possible with Compact PLUS):
- CB - CB for the CB with the higher slot letter
- CB before TB, i.e. CB in slot A or C (no parameter data transfer to TB is possible)

Note: Bit 10 must be set in the first PZD word so that the converter will accept the process data as being valid. For this reason, the control word 1 must be transferred to the converter in the first PZD word.


PKW Reply
r739.17 to .20
PKW processing
PKW Word 1 CB/TB
PKW Word 2 CB/TB
PKW Word 3 CB/TB
PKW Word 4 CB/TB
01
02
03
04
PKW words
Transmit
PZD words
Dual-Port-RAM
PKW words
PZD words
Transmit telegram
U950.25 = ___(4)
SrcCB/TBTrnsData
P0736 (0)
CB/TBTrnsData
r735.17 to .32
K
.01
.02
.03
.04
.05
.06
.07
.08
.09
.10
.11
.12
.13
.14
.15
.16
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Transmitting 32 bit words:
If the same double-word connector is connected up to two successive connector indices, this is transmitted as a 32 bit word..
Examples:
1.
KK1000
KK1000
P0736 (0)
1000
1000
.02
.03
KK1000 is transmitted as a 32 bit word
2.
KK2000
KK1000
KK900
P0736 (0)
2000
1000
900
.02
.03
.04
Only the high part of KK1000 and KK2000 is transmitted as a 16 bit word.

n959.20 = 7

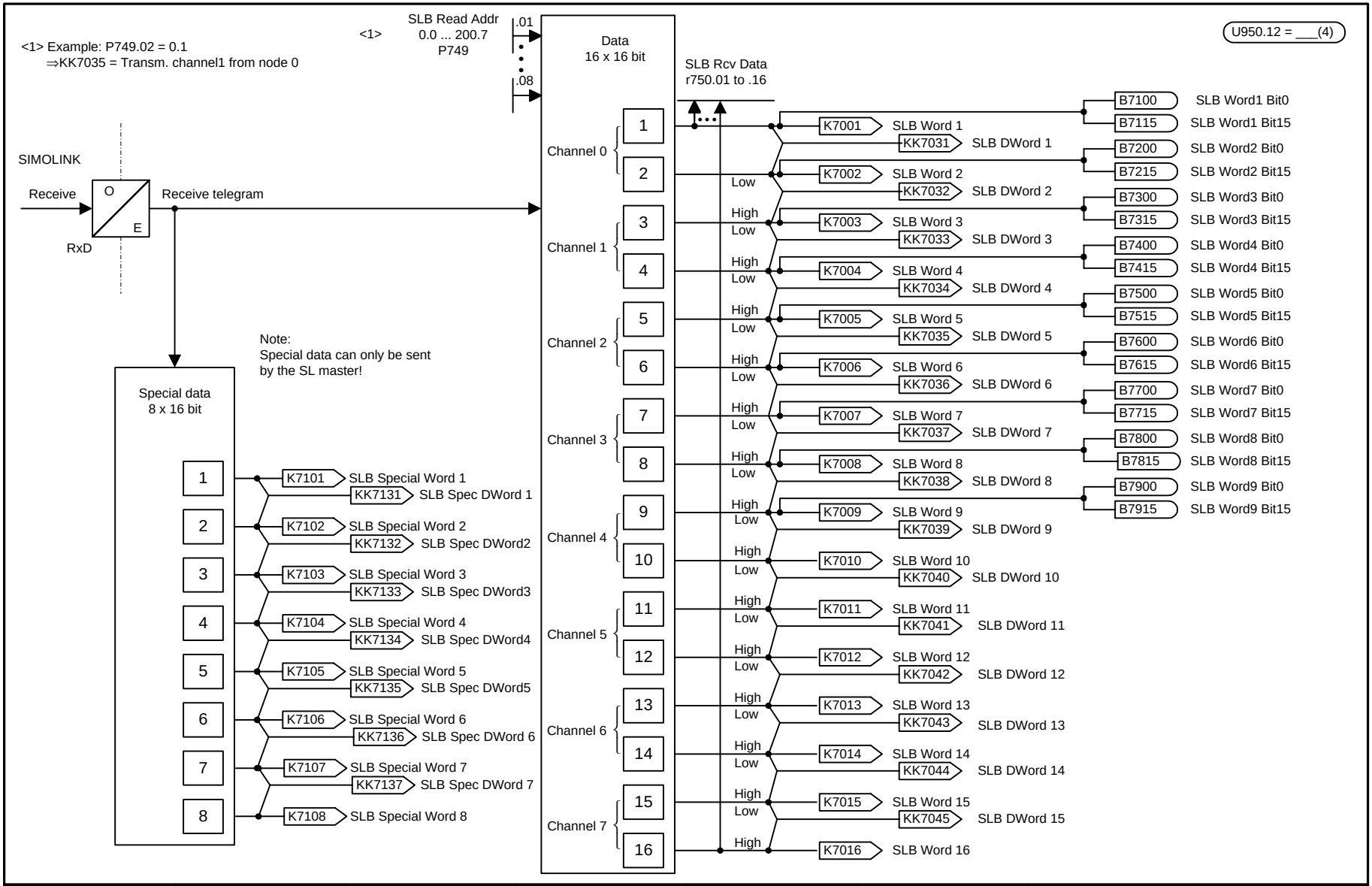


<1> f: Number of addressed nodes = $(\frac{P746 + 3{,}18\ us}{6{,}36\ us} - 2) \times \frac{1}{P745}$; 6,36us = time for 1 telegram (3,18 due to rounding)

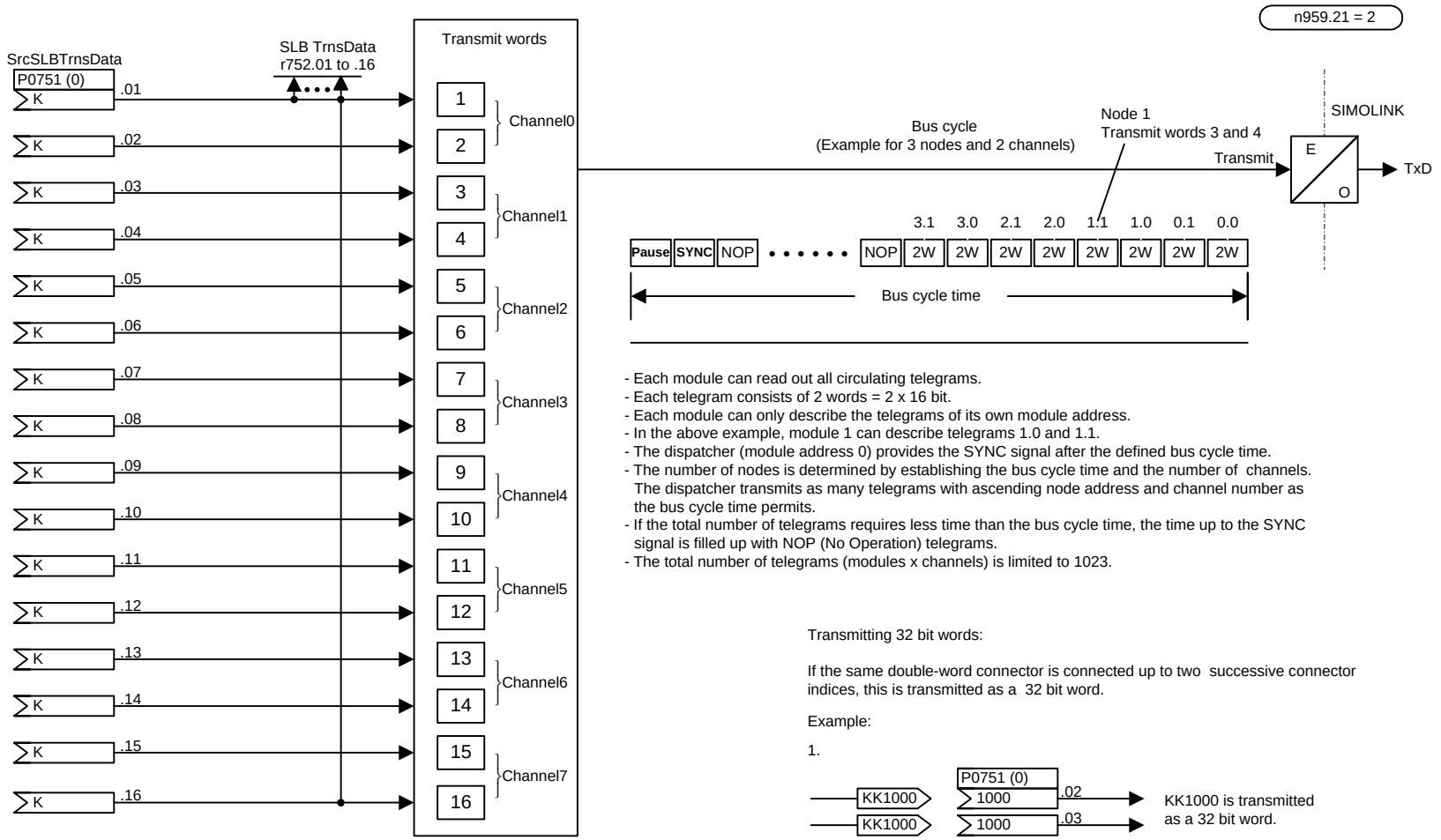
<2> Number of channels = Number of transmission channels (32-bit transmit words) per node; is according to the node which uses the most transmission channels.

When SIMOLINK is used, telegram failure monitoring should always be activated!
For the SLB telegram failure time
P741 = 4* P746 (SLB bus cycle time) is recommended.

1	2	3	4	5	6	7	8
SIMOLINK board (SLB)					fp_vc_140_e.vsd	Function diagram	- 140 -
Configuration and diagnosis					12.10.01	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
SIMOLINK Board					fp_vc_150_e.vsd	Function diagram	- 150 -
Receiving					09.04.98	MASTERDRIVES VC	



- Each module can read out all circulating telegrams.
- Each telegram consists of 2 words = 2 x 16 bit.
- Each module can only describe the telegrams of its own module address.
- In the above example, module 1 can describe telegrams 1.0 and 1.1.
- The dispatcher (module address 0) provides the SYNC signal after the defined bus cycle time.
- The number of nodes is determined by establishing the bus cycle time and the number of channels. The dispatcher transmits as many telegrams with ascending node address and channel number as the bus cycle time permits.
- If the total number of telegrams requires less time than the bus cycle time, the time up to the SYNC signal is filled up with NOP (No Operation) telegrams.
- The total number of telegrams (modules x channels) is limited to 1023.

Transmitting 32 bit words:

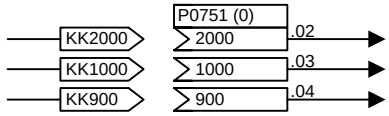
If the same double-word connector is connected up to two successive connector indices, this is transmitted as a 32 bit word.

Example:

1.

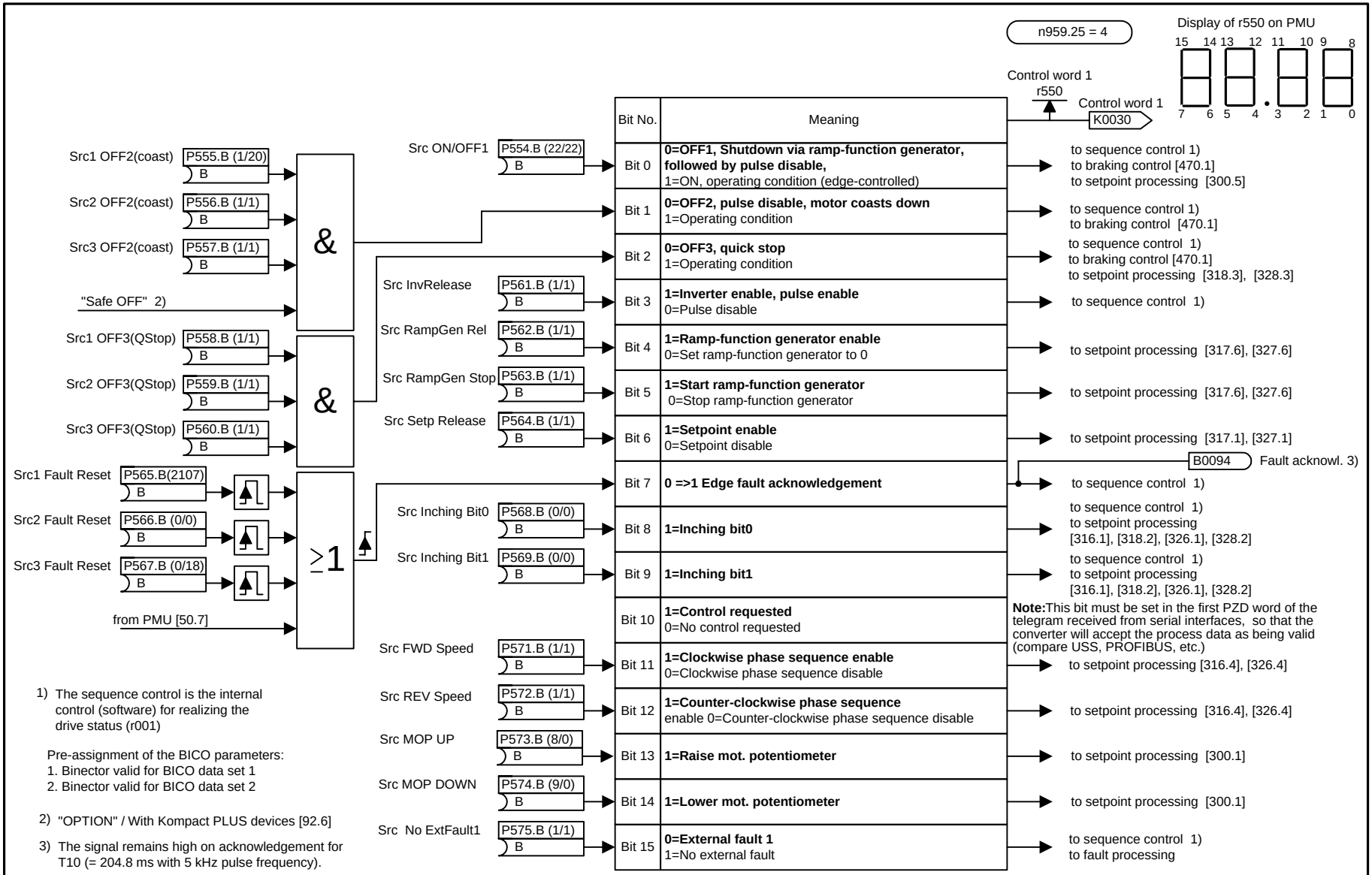
KK1000 is transmitted as a 32 bit word.

2.

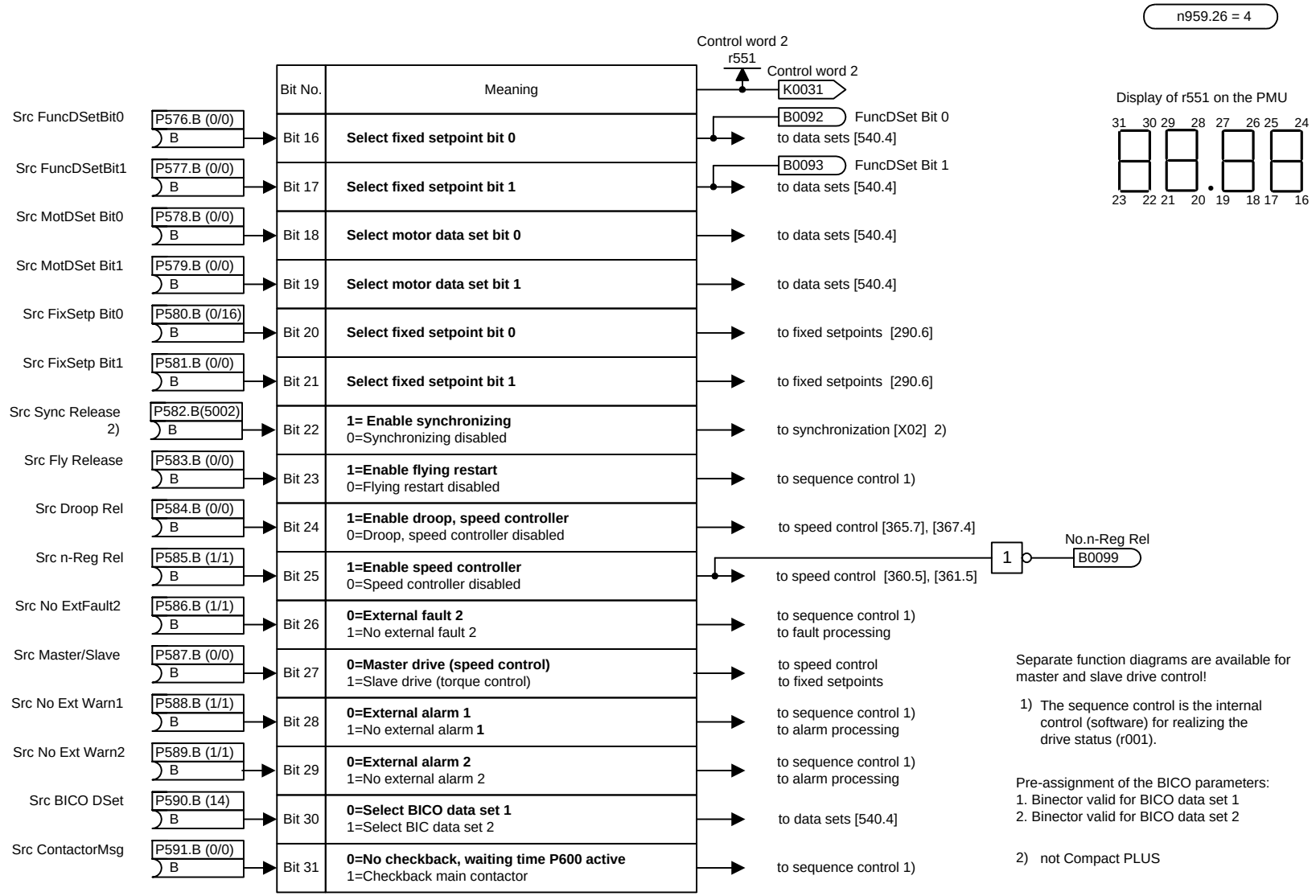


Only the high part of KK1000 and KK2000 is transmitted as a 16 bit word.

1	2	3	4	5	6	7	8
SIMOLINK board					fp_vc_160_e.vsd	Function diagram	- 160 -
Transmitting					09.04.98	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
Control word 1					fp_vc_180_e.vsd	Function diagram	- 180 -
					24.07.01	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
Control word 2					fp_vc_190_e.vsd	Function diagram	- 190 -
					12.10.01	MASTERDRIVES VC	

n959.27 = 4

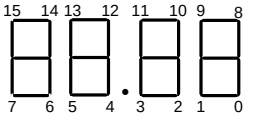
Status word 1
r552

Status word 1
K0032

	Bit No.	Meaning
from sequence control 1) →	Bit 0	**1=Ready to switch on** 0=Not ready to switch on
from sequence control 1) →	Bit 1	**1=Ready for operation (DC link loaded, pulses disabled)** 0=Not ready for operation
from sequence control 1) →	Bit 2	**1=Run (voltage at output terminals)** 0=Pulses disabled
from sequence control 1) →	Bit 3	**1=Fault active (pulses disabled)** 0=No fault
from sequence control 1) →	Bit 4	**0=OFF2 active** 1=No OFF2
from sequence control 1) →	Bit 5	**0=OFF3 active** 1=No OFF3
from sequence control 1) →	Bit 6	**1=Switch-on inhibit** 0=No switch-on inhibit (possible to switch on)
from alarm processing →	Bit 7	**1=Warning active** 0=No warning
from messages [480.7] →	Bit 8	**1=No setpoint/actual value deviation detected** 0=Setpoint/actual value deviation
from sequence control 1) →	Bit 9	**1=PZD control requested (always 1)**
from messages [480.7] →	Bit 10	**1=Comparison value reached** 0=Comparison value not reached
from fault processing →	Bit 11	**1=Low voltage fault** 0=No low voltge fault
from sequence control 1) →	Bit 12	**1=Request to energize main contactor** 0=No request to energize main contactor
from setpoint processing [317.8], [327.8] →	Bit 13	**1=Ramp-function generator active** 0=Ramp-function generator not active
from messages [480.7] →	Bit 14	**1=Positive speed setpoint** 0=Negative speed setpoint
From KIB/FLR control [600.8], [605.8] →	Bit 15	**1=Kinetic buffering/flexible response active** 0=Kinetic buffering/flexible response inactive

B0100	1	Rdy for ON	B0101 Not Rdy for ON
B0102	1	Rdy for Oper	B0103 NotRdy for Oper
B0104	1	Operation	B0105 Not operating
B0106	1	Fault	B0107 No fault
B0108	1	No OFF2	B0109 OFF2
B0110	1	No OFF3	B0111 OFF3
B0112	1	Blocked	B0113 Not blocked
B0114	1	Alarm	B0115 No alarm
B0116	1	No Deviation	B0117 Deviation
B0120	1	CompV OK	B0121 CompV not OK
B0122	1	Low Voltage	B0123 No Low Voltage
B0124	1	Energize MCon	B0125 N.Energ.MCon
B0126	1	RampGen active	B0127 RampGen n.act.
B0128	1	Speed Setp FWD	B0129 Speed Setp REV
B0130	1	KIB/FLR active	B0131 KIB/FLR n.active

Display of r552 on the PMU



1) The sequence control is the internal control (software) for realizing the drive status (r001).

1	2	3	4	5	6	7	8
Status word 1					fp_vc_200_e.vsd	Function diagram	- 200 -
					31.01.98	MASTERDRIVES VC	

n959.28 = 4

Status word 2
r553

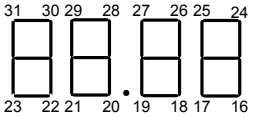
Status word 2
K0033

Bit No.	Meaning
Bit 16	**1=Flying restart or excitation active** 0=Flying restart not active or excitation finished
Bit 17	**1=Synchronism achieved** 0=Synchronism not achieved
Bit 18	**0=Overspeed** 1=No overspeed
Bit 19	**1=External fault 1 active** 0=No external fault 1
Bit 20	**1=External fault 2 active** 0=No external fault 2
Bit 21	**1=External warning active** 0=No external warning
Bit 22	**1=Converter overload warning active** 0=No converter overload warning
Bit 23	**1=Converter overtemperature fault active** 0=No converter overtemperature fault
Bit 24	**1=Converter overtemperature warning active** 0=No converter overtemperature warning
Bit 25	**1=Motor overtemperature warning active** 0=No motor overtemperature warning
Bit 26	**1=Motor overtemperature fault active** O=No motor overtemperature fault
Bit 27	**Reserve**
Bit 28	**1=Motor pulled out/blocked fault active** 0=No motor pulled out/blocked fault
Bit 29	**1=Bypass contactor energized (only AC units)** 0=Bypass contactor not energized
Bit 30	**1=Fault during synchronization** 0=No fault during synchronization
Bit 31	**1=Pre-charging active** 0=Pre-charging not active

from sequence control 1) → Bit 16
from synchronization [X01.6] → Bit 17
from messages [480.7] → Bit 18
from sequence control 1) → Bit 19
from sequence control 1) → Bit 20
from sequence control 1) → Bit 21
from alarm processing → Bit 22
from fault processing → Bit 23
from alarm processing → Bit 24
from alarm processing → Bit 25
from fault processing → Bit 26
from block/pullout diagnosis [485.8] → Bit 28
from sequence control 1) → Bit 29
from synchronization [X01.6] 3) → Bit 30
from sequence control 1) → Bit 31

1	B0132	Fly/Exc active	B0133 Fly/Exc n.act. 2)
1	B0134	Sync reached	B0135 Sync n.reached 3)
1	B0136	Overspeed	B0137 No Overspeed
1	B0138	Ext Fault 1	B0139 No Ext Fault 1
1	B0140	Ext Fault 2	B0141 No Ext Fault 2
1	B0142	Ext Warning	B0143 No Ext Warning
1	B0144	Ovld Warn Drive	B0145 No OvldWarn Drv
1	B0146	Tmp Flt Drive	B0147 No Tmp Flt Drv
1	B0148	TmpWarn Drive	B0149 No TmpWarn Drv
1	B0150	TmpWarnMotor	B0151 No TmpWarnMotor
1	B0152	TmpFltMotor	B0153 No TmpFltMotor
1	B0156	Motor PullOut	B0157 No MotorPullOut
1	B0158	ChrgRelay close	B0159 ChrgRelay open
1	B0160	Sync Fault	B0161 No Sync Fault 3)
1	B0162	Prechrg active	B0163 Prechrg n.act.

Display of r553 on the PMU

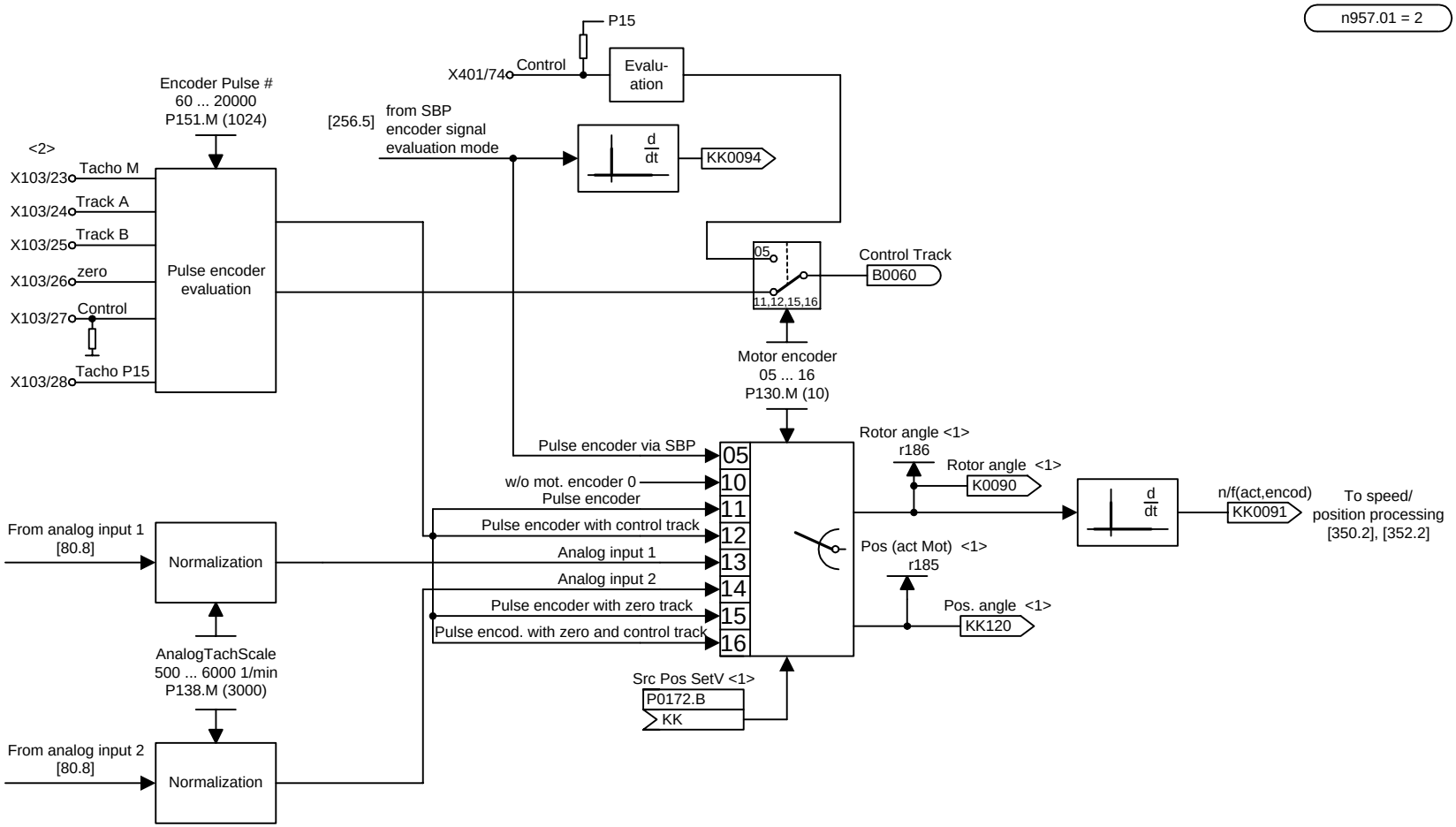


1) The sequence control is the internal control (software) for realizing the drive status (r001).

2) in addition
ExcitationEnd
B0255

3) not Compact PLUS

1	2	3	4	5	6	7	8
Status word 2					fp_vc_210_e.vsd	Function diagram	- 210 -
					24.07.01	MASTERDRIVES VC	

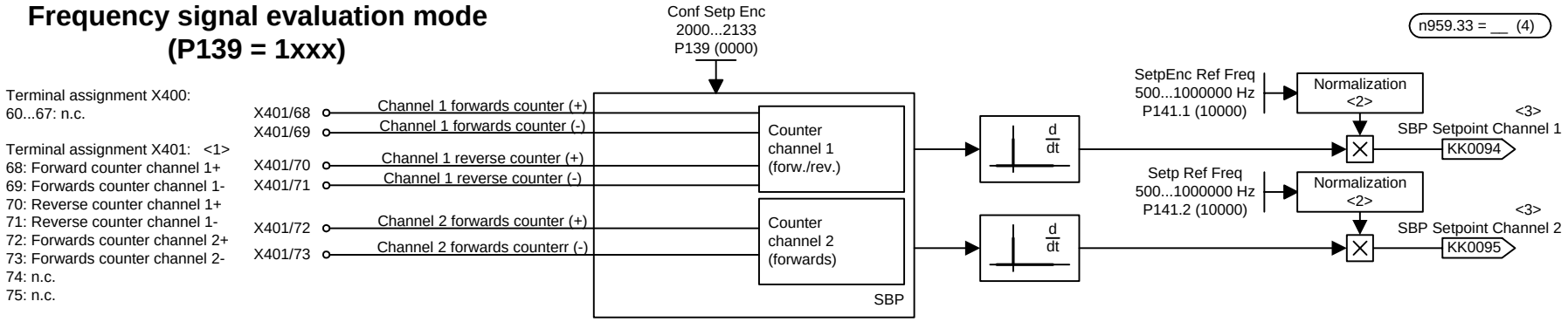


<1> Angle displayed only at P130 = 15,16

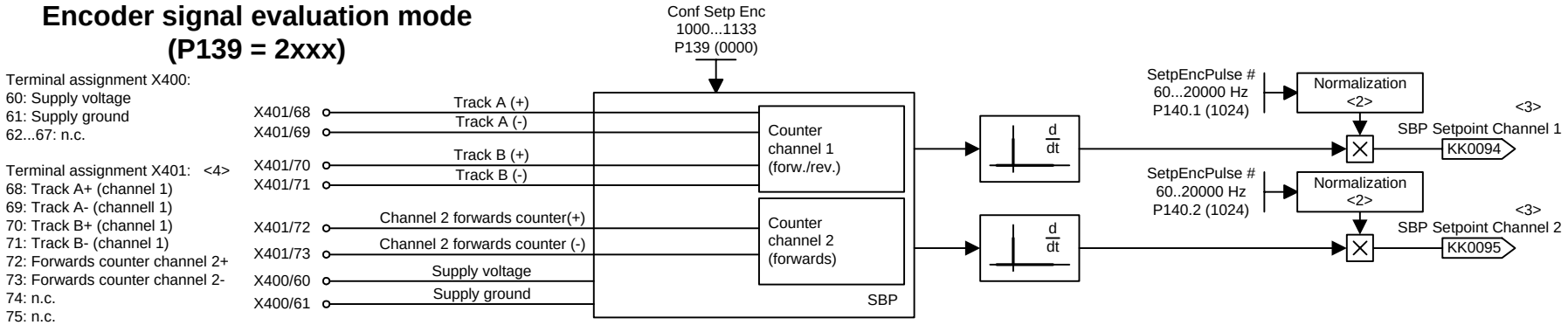
<2> Compact PLUS: terminal strip X104

1	2	3	4	5	6	7	8
Encoder evaluation					fp_vc_250_e.vsd	Function diagram	- 250 -
Speed/position processing					24.07.01	MASTERDRIVES VC	

Frequency signal evaluation mode (P139 = 1xxx)



Encoder signal evaluation mode (P139 = 2xxx)



<1> maximum input frequency: 1 MHz

<2> Normalization via
- Frequency signal evaluation mode
  Frequency (frequencies stated in P141.1 and .2 correspond to the output of 100% to the connectors KK0094 and KK0095.
- Encoder signal evaluation mode
  Pulse number (pulse numbers of connected encoders stated in P140.1 and .2)

<3> optional smoothing s. Function Diagram 735

<4> maximum input frequency: 410 kHz

Setting P139:

Input level A/B track

xxx0: Channel 1 / encoder input HTL unipolar
xxx1: Channel 1 / encoder input TTL unipolar
xxx2: Channel 1 / encoder input HTL differential input
xxx3: Channel 1 / encoder input TTL / RS422

Input level zero track

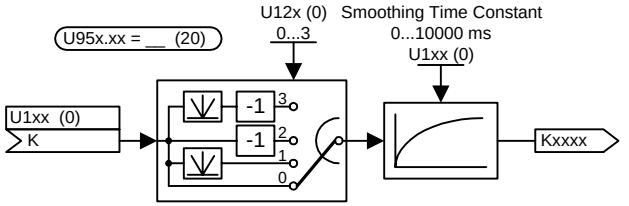
xx0x: Channel 2 HTL unipolar
xx1x: Channel 2 TTL unipolar
xx2x: Channel 2 HTL differential input
xx3x: Channel 2 TTL / RS422

Mode of setpoint evaluation

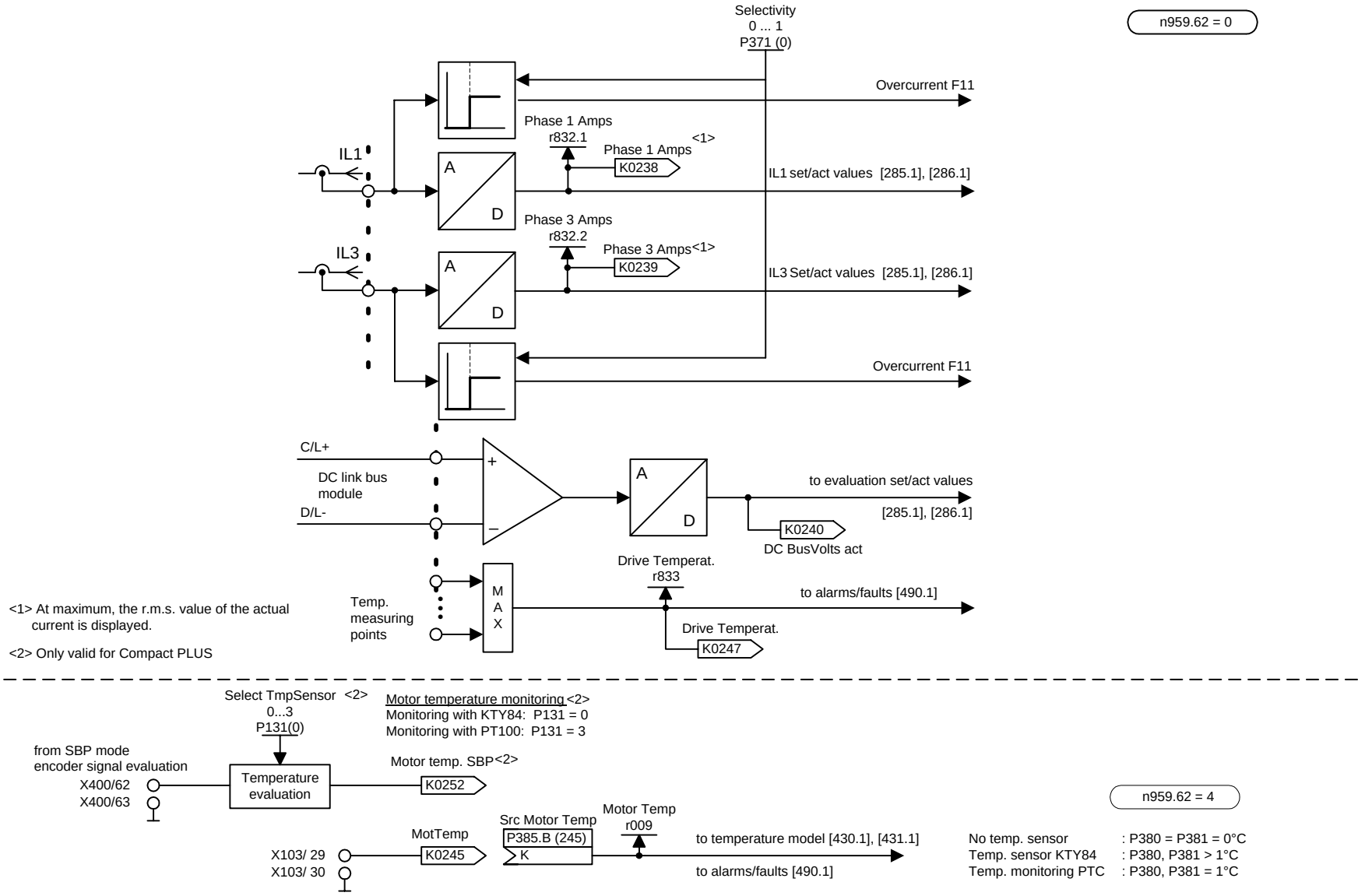
0xxx: Frequency signal evaluation deactivated
1xxx: Frequency signal evaluation mode
2xxx: Encoder signal evaluation mode

Encoder power supply

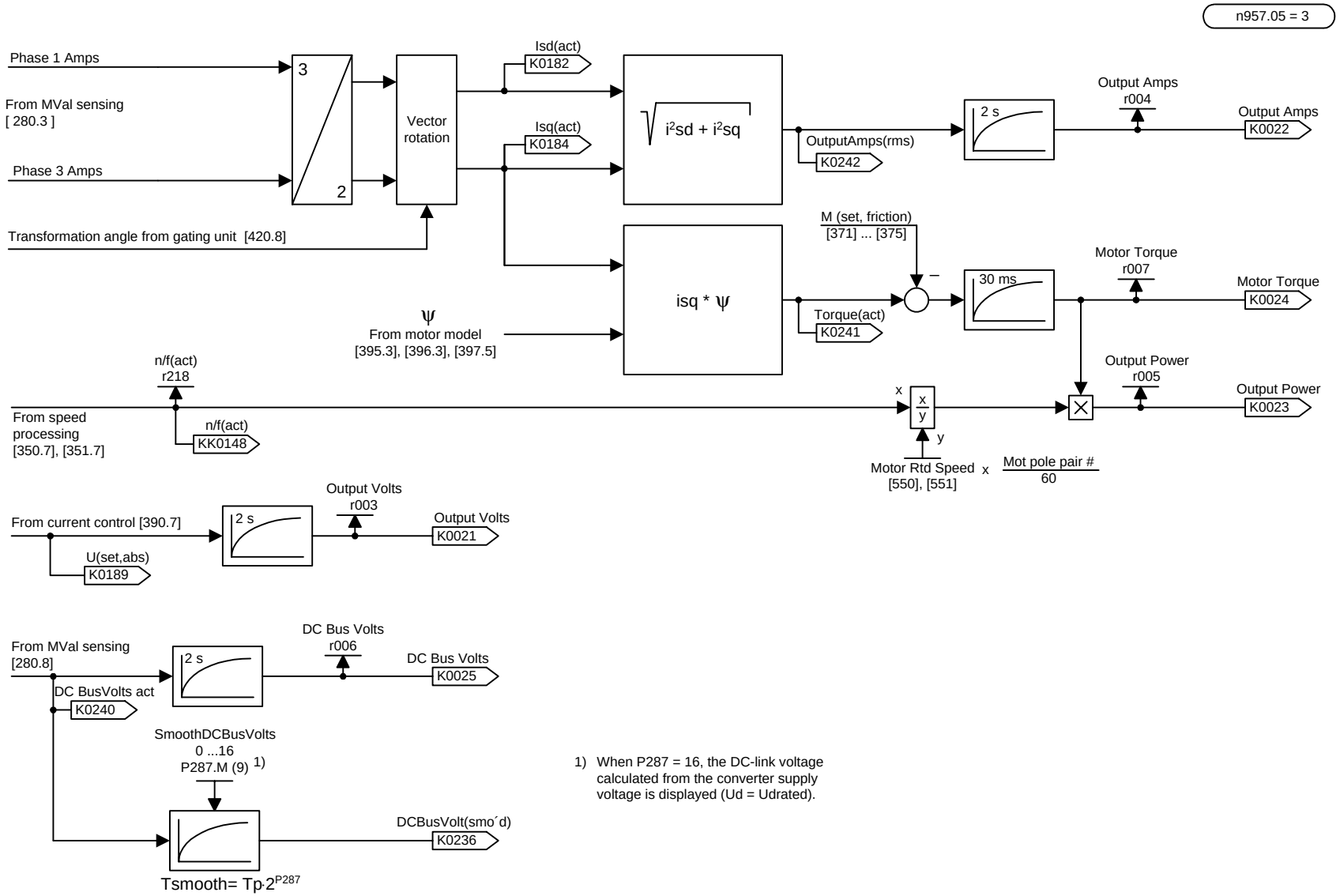
x0xx: 5V
x1xx: 15V



1	2	3	4	5	6	7	8
Setpoint input					fp_vc_256_e.vsd	Function diagram	- 256 -
Setpoint input via external frequency or encoder signals with the SBP optional board					02.07.00	MASTERDRIVES VC	

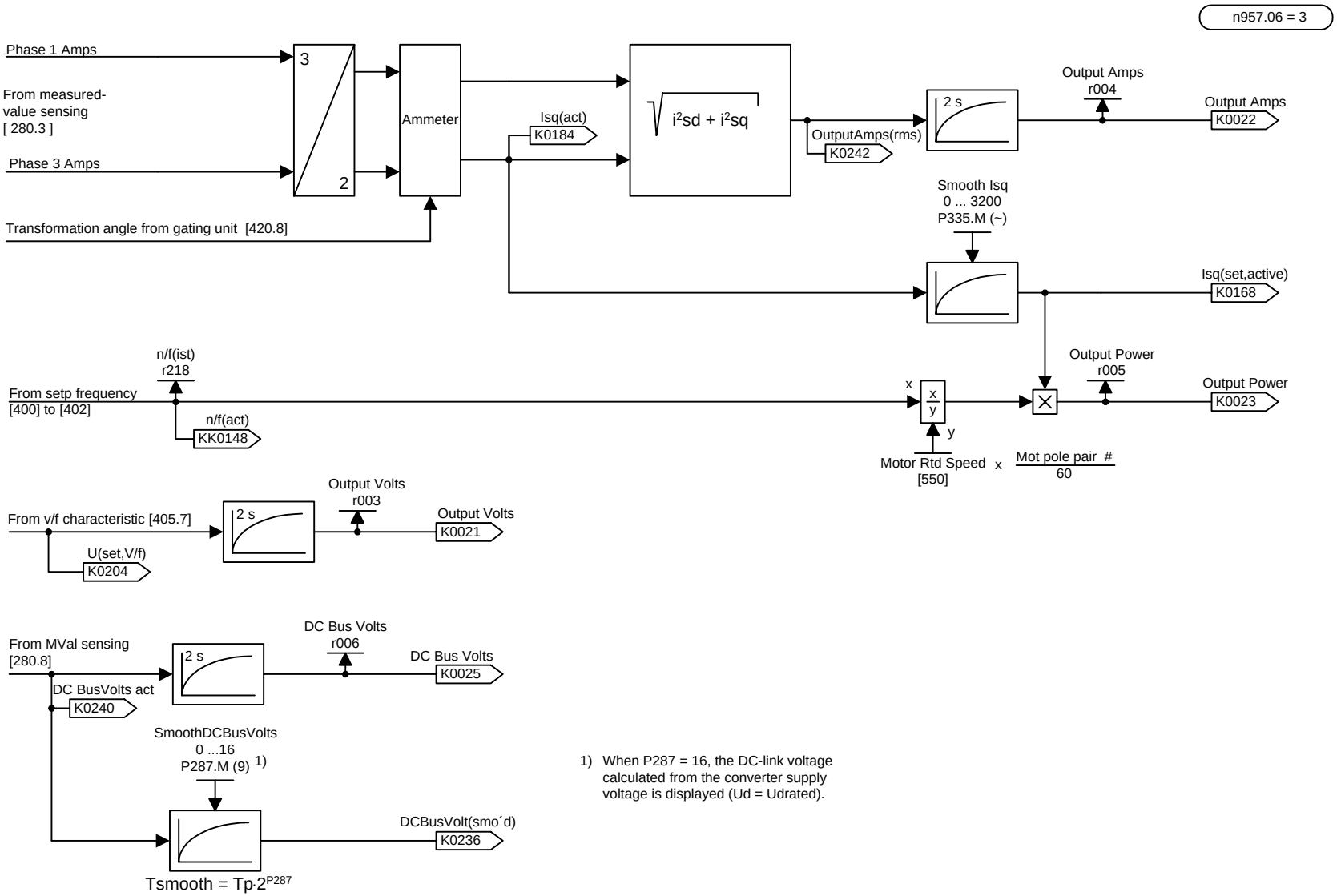


1	2	3	4	5	6	7	8
Measured-value sensing					fp_vc_280_e.vsd	Function diagram	- 280 -
n/f/T control, master/slave drive, v/f control					24.10.01	MASTERDRIVES VC	



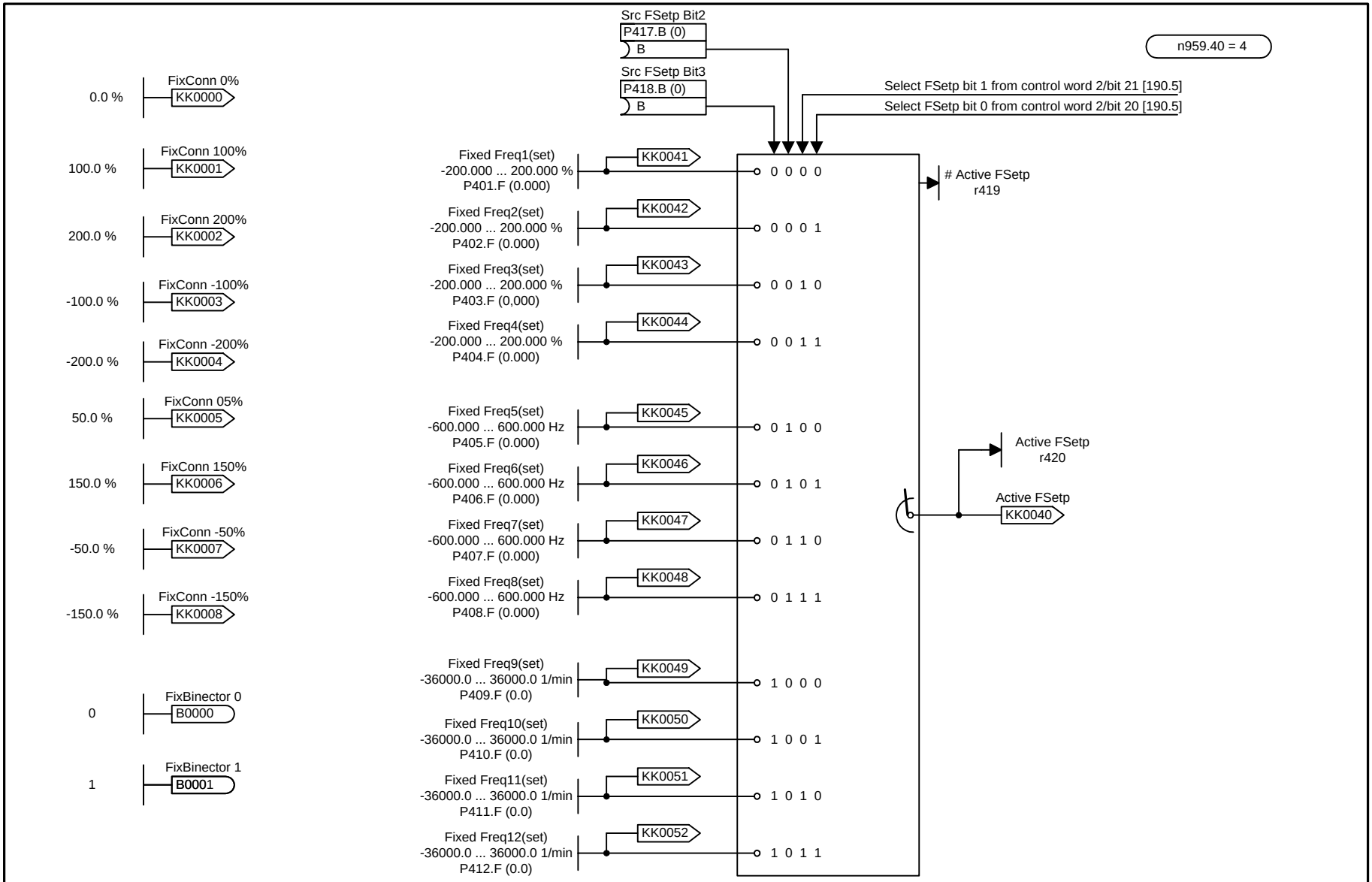
1) When P287 = 16, the DC-link voltage calculated from the converter supply voltage is displayed (Ud = Udrated).

1	2	3	4	5	6	7	8
Evaluation of setpoints/actual values for voltage/current/torque/output					fp_vc_285_e.vsd	Function diagram	- 285 -
n/f/T control, master/slave drive					12.10.01	MASTERDRIVES VC	



1) When P287 = 16, the DC-link voltage calculated from the converter supply voltage is displayed (Ud = Udrated).

1	2	3	4	5	6	7	8
Evaluation of set/actual values for voltage/current/torque/output					fp_vc_286_e.vsd	Function diagram	- 286 -
V/f open-loop control					12.10.01	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
Setpoint channel					fp_vc_290_e.vsd	Function diagram	- 290 -
Fixed setpoints					31.01.98	MASTERDRIVES VC	

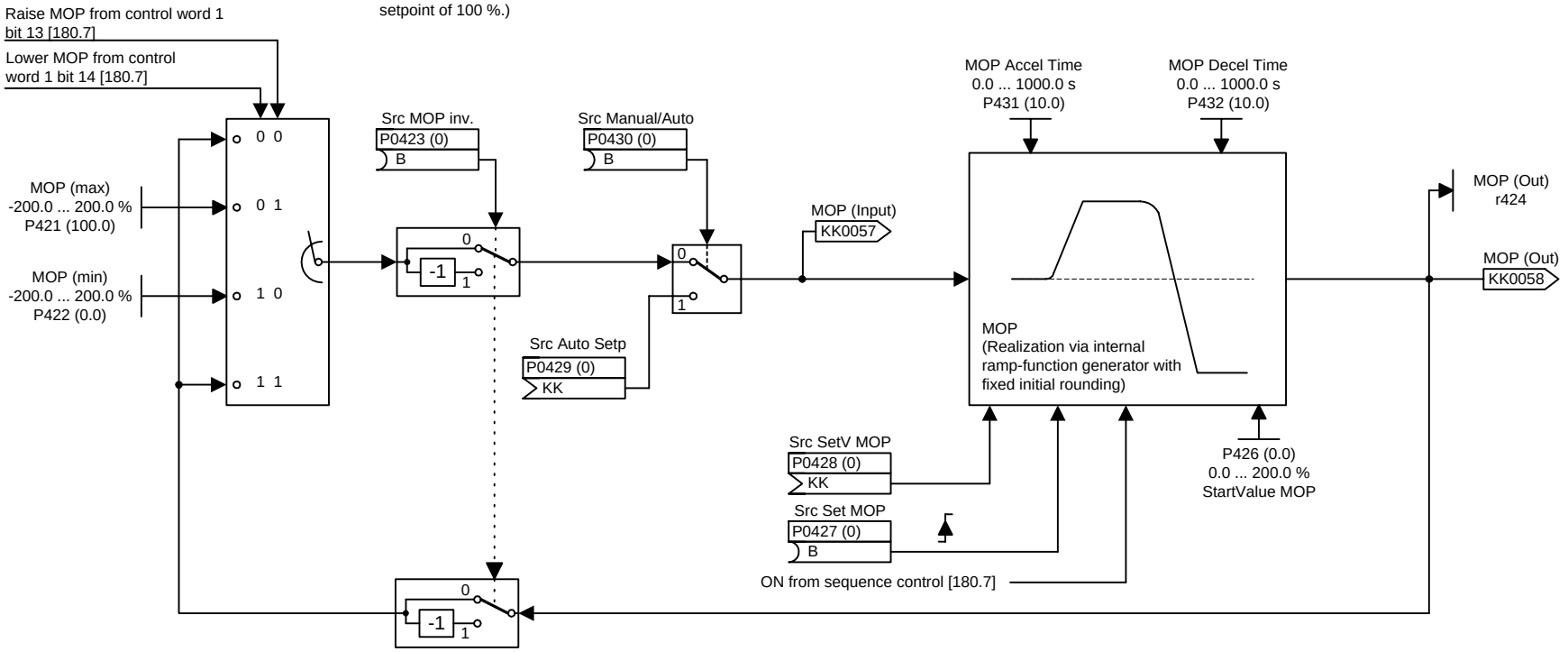
n959.41 = 4

Conf MOP
0000 ... 0111
P425 (0110)

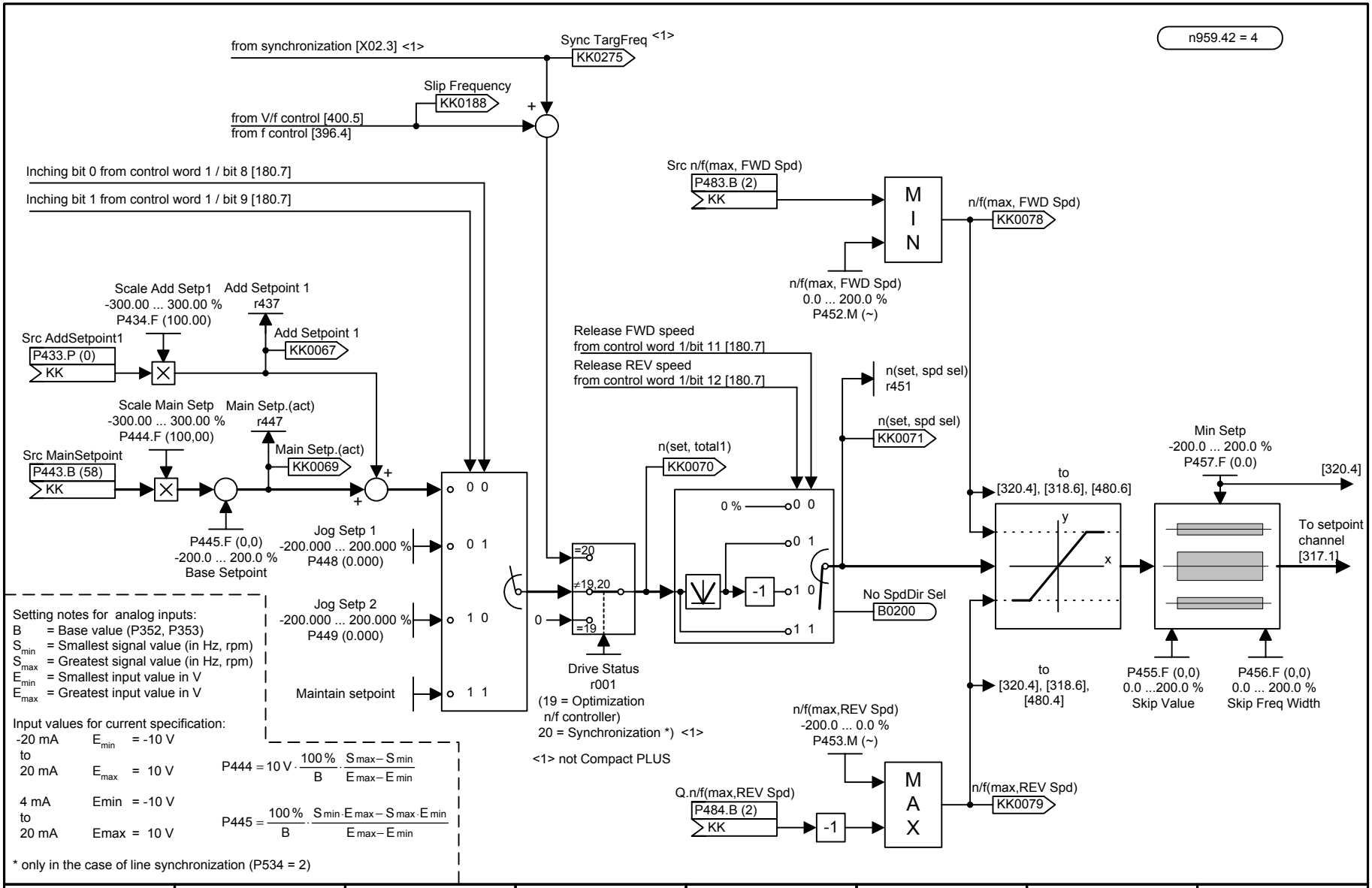
MOP storage:
0 Mot. potentiometer setpoint is not stored, starting point is specified after ON by P426 StartValue MOP
1 Mot. potentiometer setpoint is stored in a non-volatile manner after OFF. After ON the mot. potentiometer is set to this value

Ramp generator:
0 Ramp generator is not effective in automatic mode, accel./decel. time = 0
1 Ramp generator is always effective

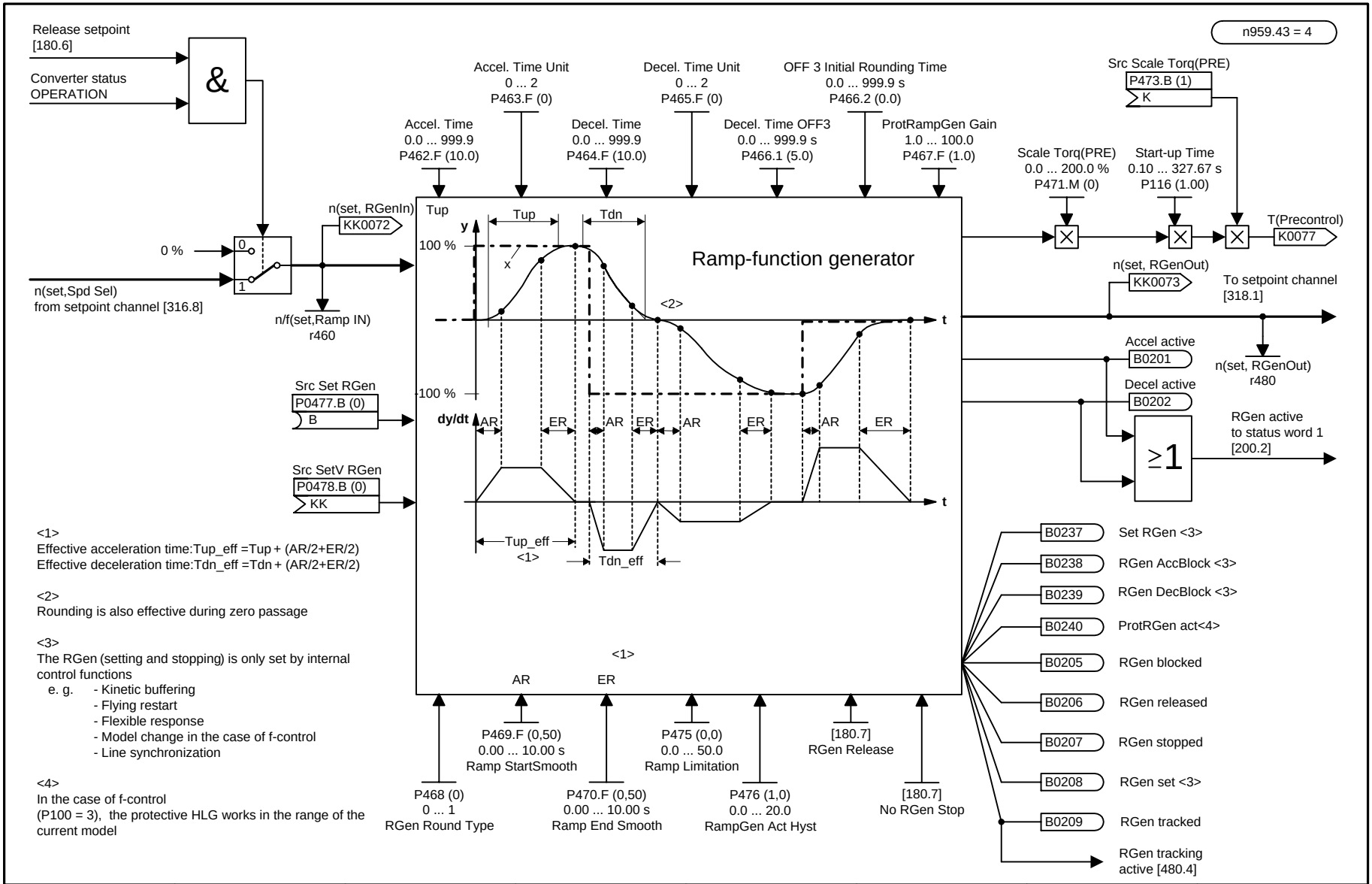
Initial rounding:
0 Without initial rounding
1 With initial rounding (with which the times set in P431 and P432 are not precisely realized. P431 and P432 refer to a setpoint of 100 %.)



1	2	3	4	5	6	7	8
Setpoint channel					fp_vc_300_e.vsd	Function diagram	- 300 -
Motorized potentiometer					31.01.98	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
Setpoint channel (part 1)					fp_vc_316_e.vsd	Function diagram	- 316 -
Master Drive					24.07.01	MASTERDRIVES VC	



<1>
Effective acceleration time:Tup_eff =Tup + (AR/2+ER/2)
Effective deceleration time:Tdn_eff =Tdn + (AR/2+ER/2)

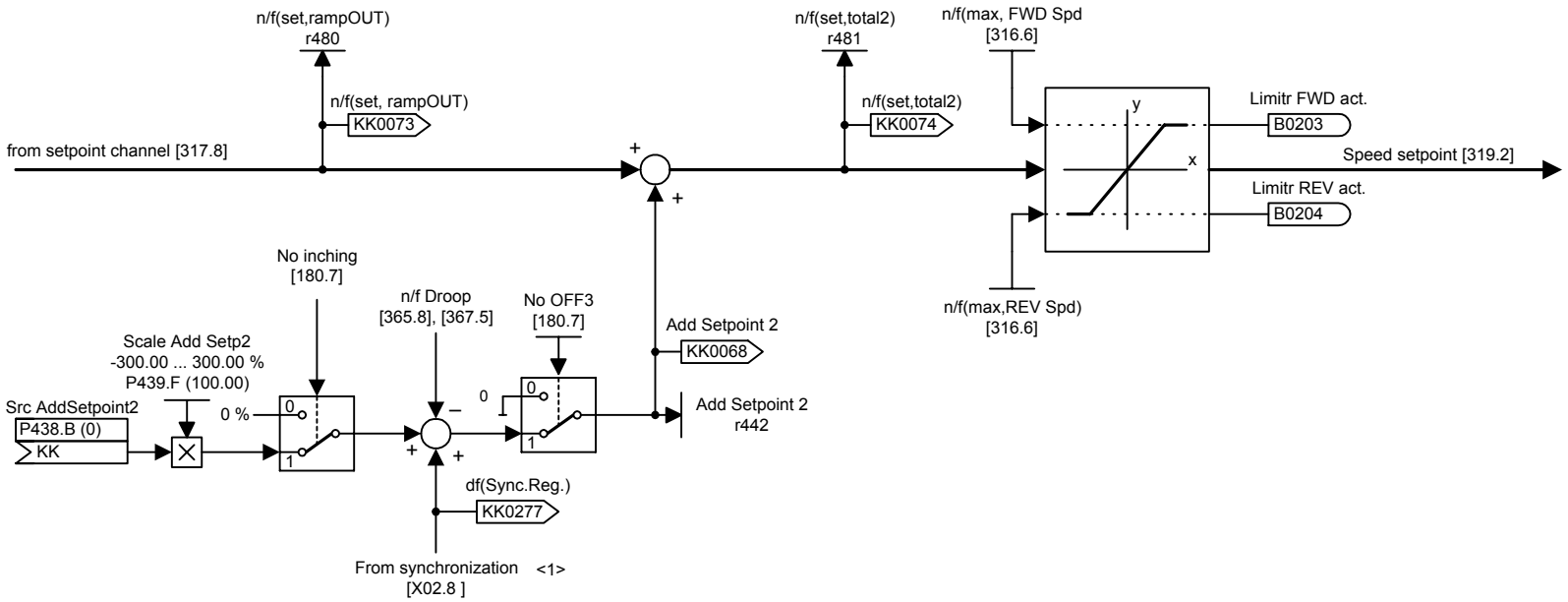
<2>
Rounding is also effective during zero passage

<3>
The RGen (setting and stopping) is only set by internal control functions
e. g. - Kinetic buffering
- Flying restart
- Flexible response
- Model change in the case of f-control
- Line synchronization

<4>
In the case of f-control
(P100 = 3), the protective HLG works in the range of the current model

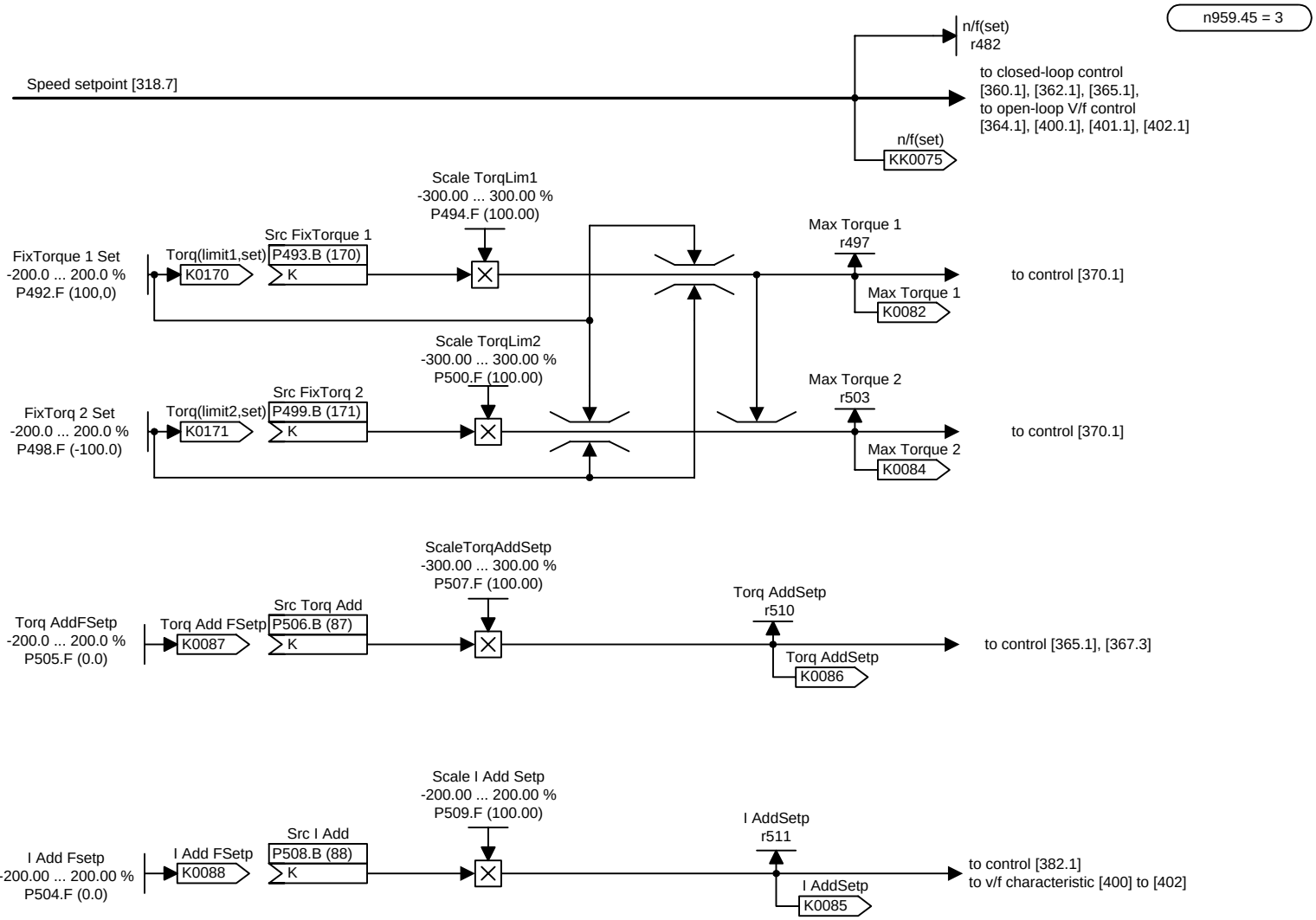
1	2	3	4	5	6	7	8
Setpoint channel (Part 2)					fp_vc_317_e.vsd	Function diagram	- 317 -
Master drive + RFG					09.04.98	MASTERDRIVES VC	

n959.44 = 3

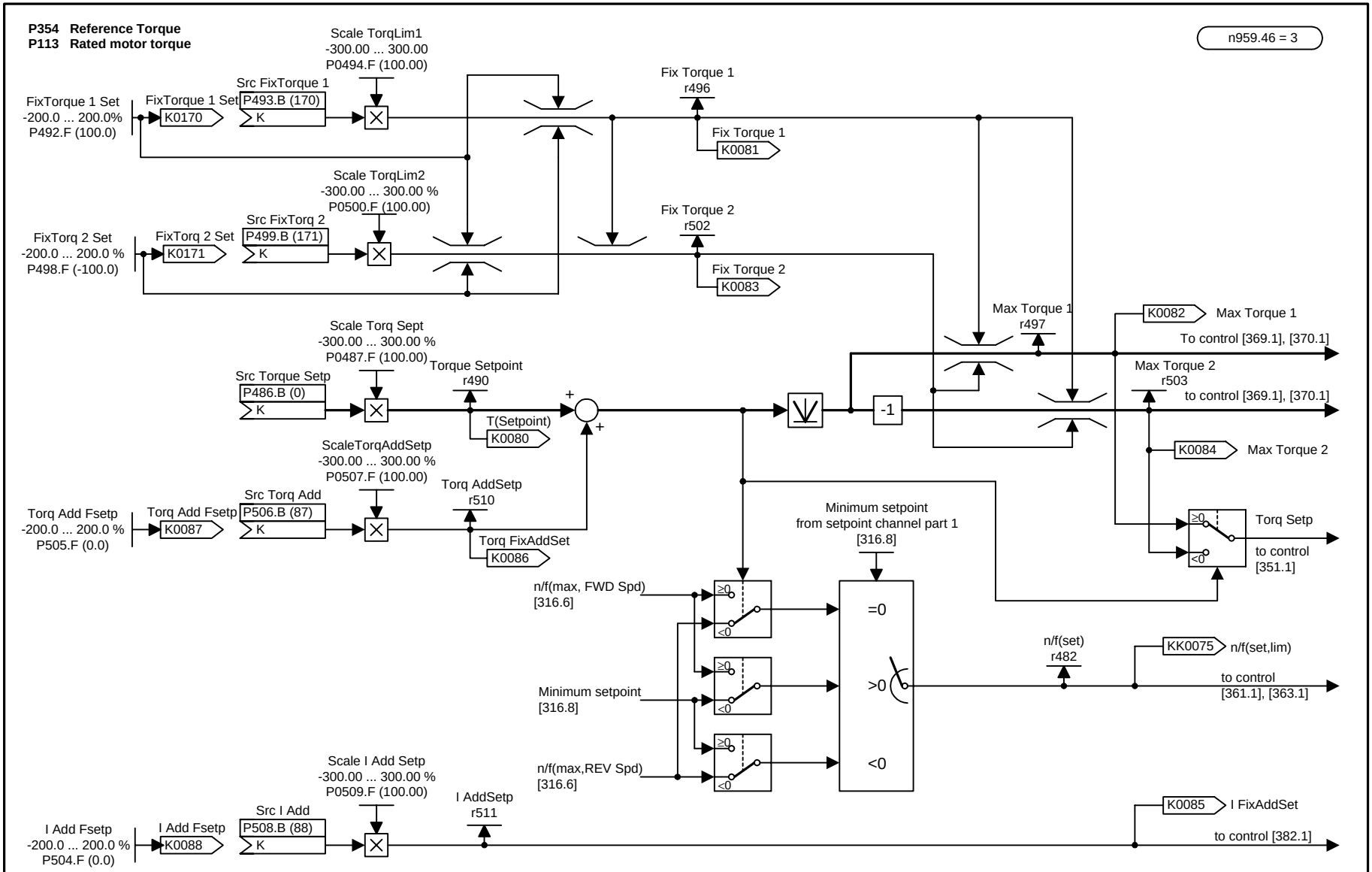


<1> not Compact PLUS

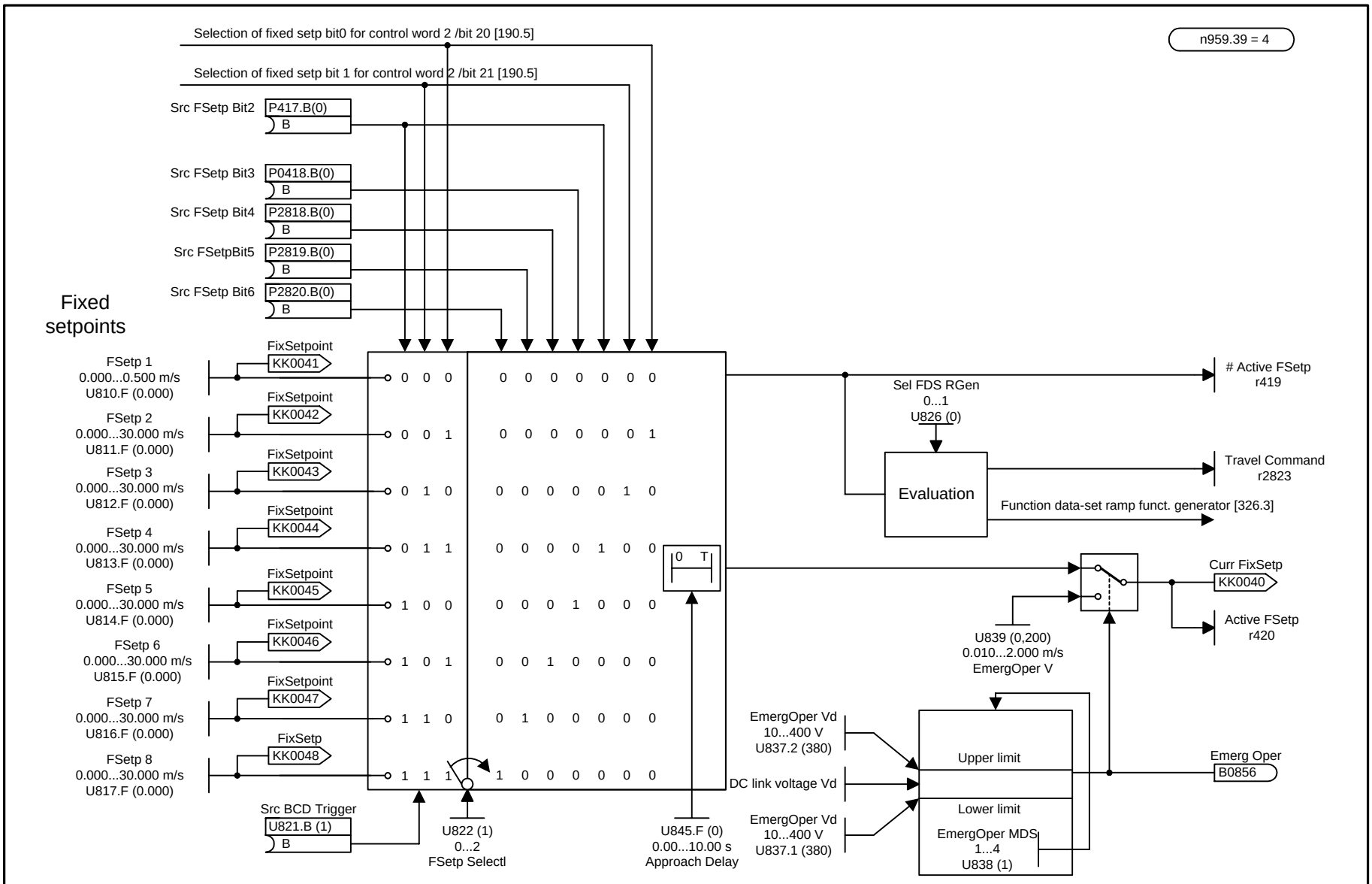
1	2	3	4	5	6	7	8
Setpoint channel (part 3)					fp_vc_318_e.vsd	Function diagram	- 318 -
Master drive					12.10.01	MASTERDRIVES VC	



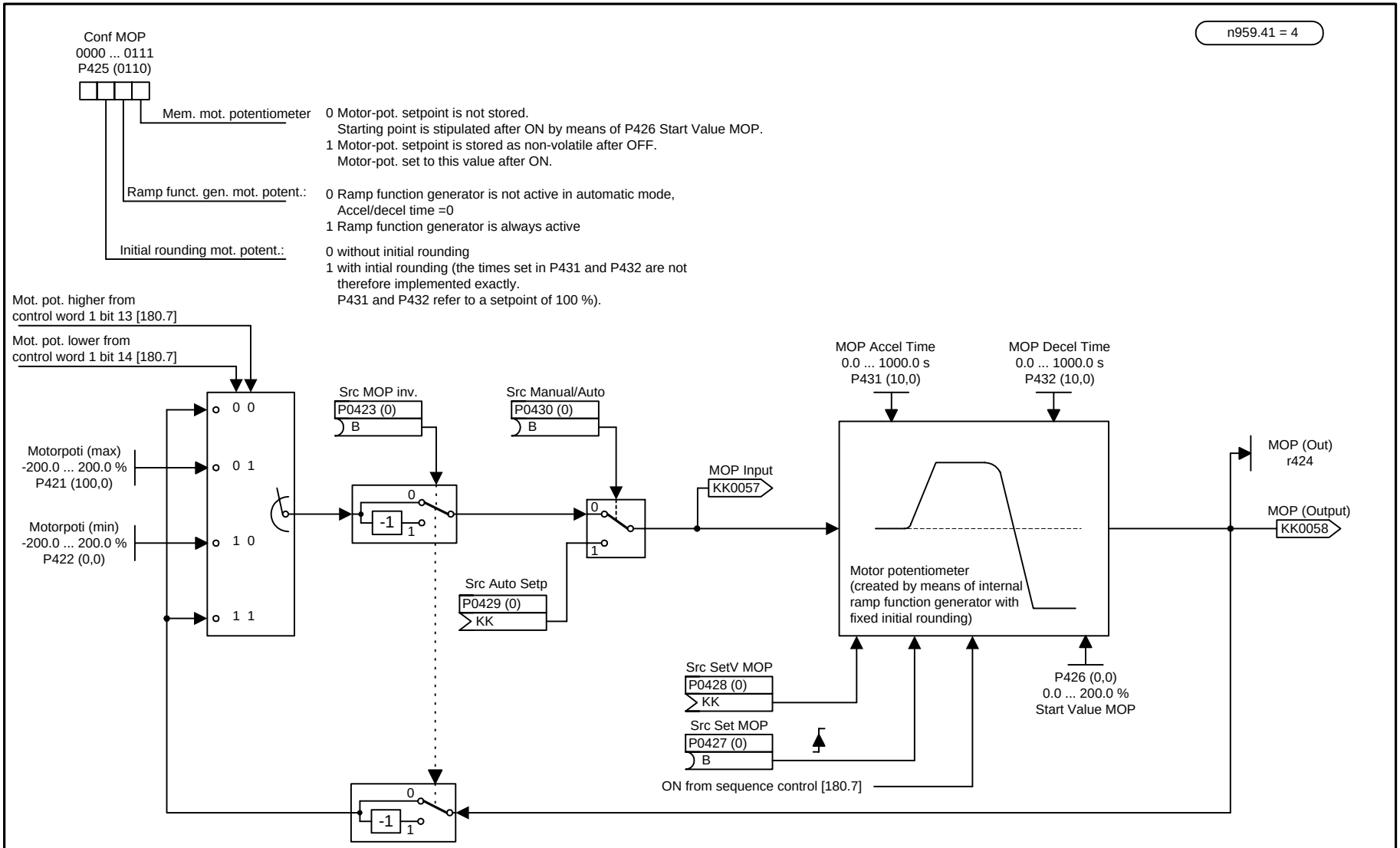
1	2	3	4	5	6	7	8
Setpoint channel (part 4)					fp_vc_319_e.vsd	Function diagram	- 319 -
Master drive					31.01.98	MASTERDRIVES VC	



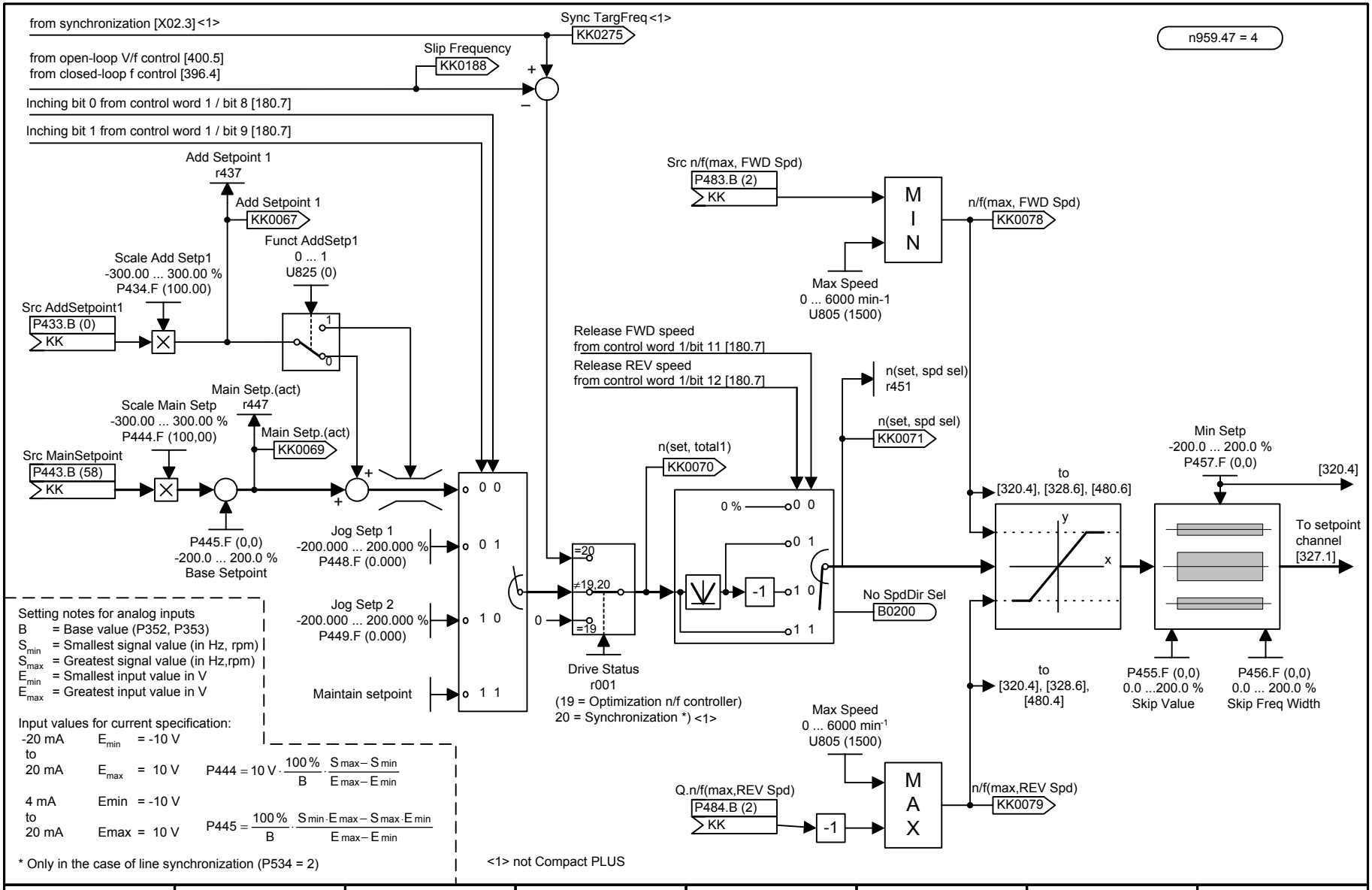
1	2	3	4	5	6	7	8
Setpoint channel					fp_vc_320_e.vsd	Function diagram	- 320 -
Slave drive					31.01.98	MASTERDRIVES VC	



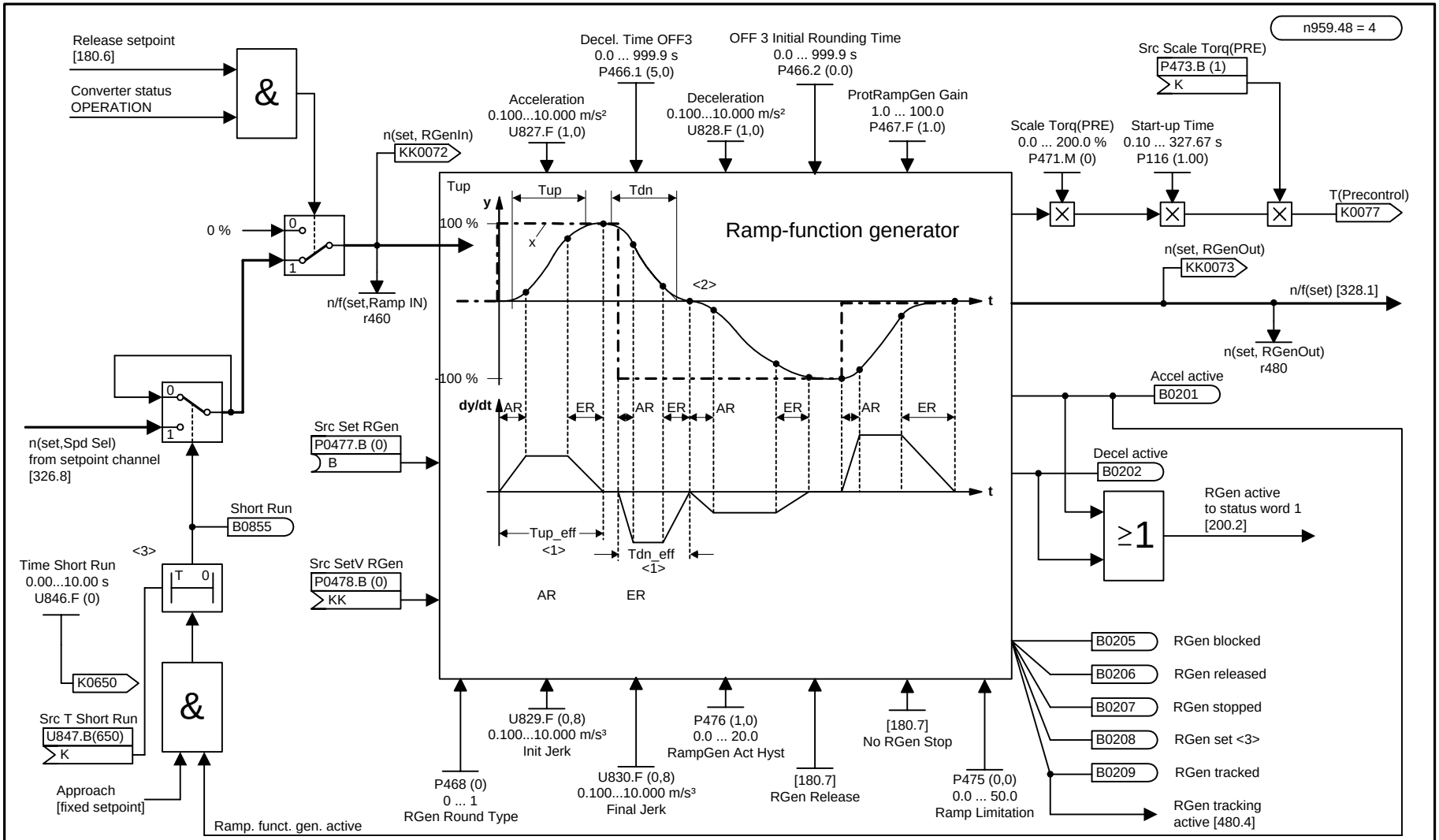
1	2	3	4	5	6	7	8
Setpoint channel					fp_vc_324_e.vsd	Function diagram	- 324 -
Fixed setpoints, lift and hoisting-gear applications (U800=1)					26.10.01	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
Setpoint channel					fp_vc_325_e.vsd	Function diagram	- 325 -
Motor potentiometer					10.10.98	MASTERDRIVES VC	

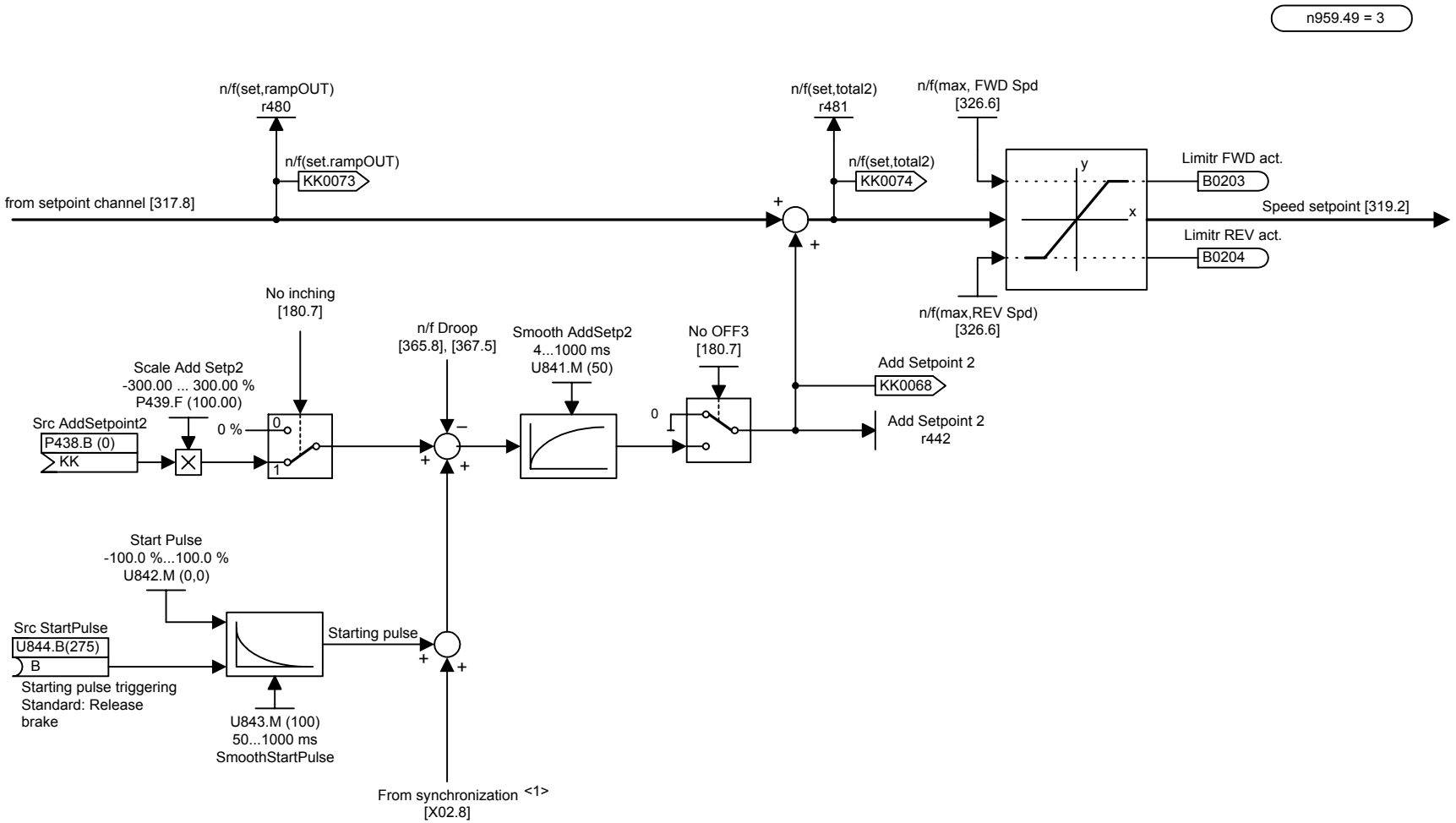


1	2	3	4	5	6	7	8
Setpoint channel (Part 1)					fp_vc_326_e.vsd	Function diagram	- 326 -
Master Drive, Lift And Hoisting-Gear Applications (U800 = 1)					26.10.01	MASTERDRIVES VC	



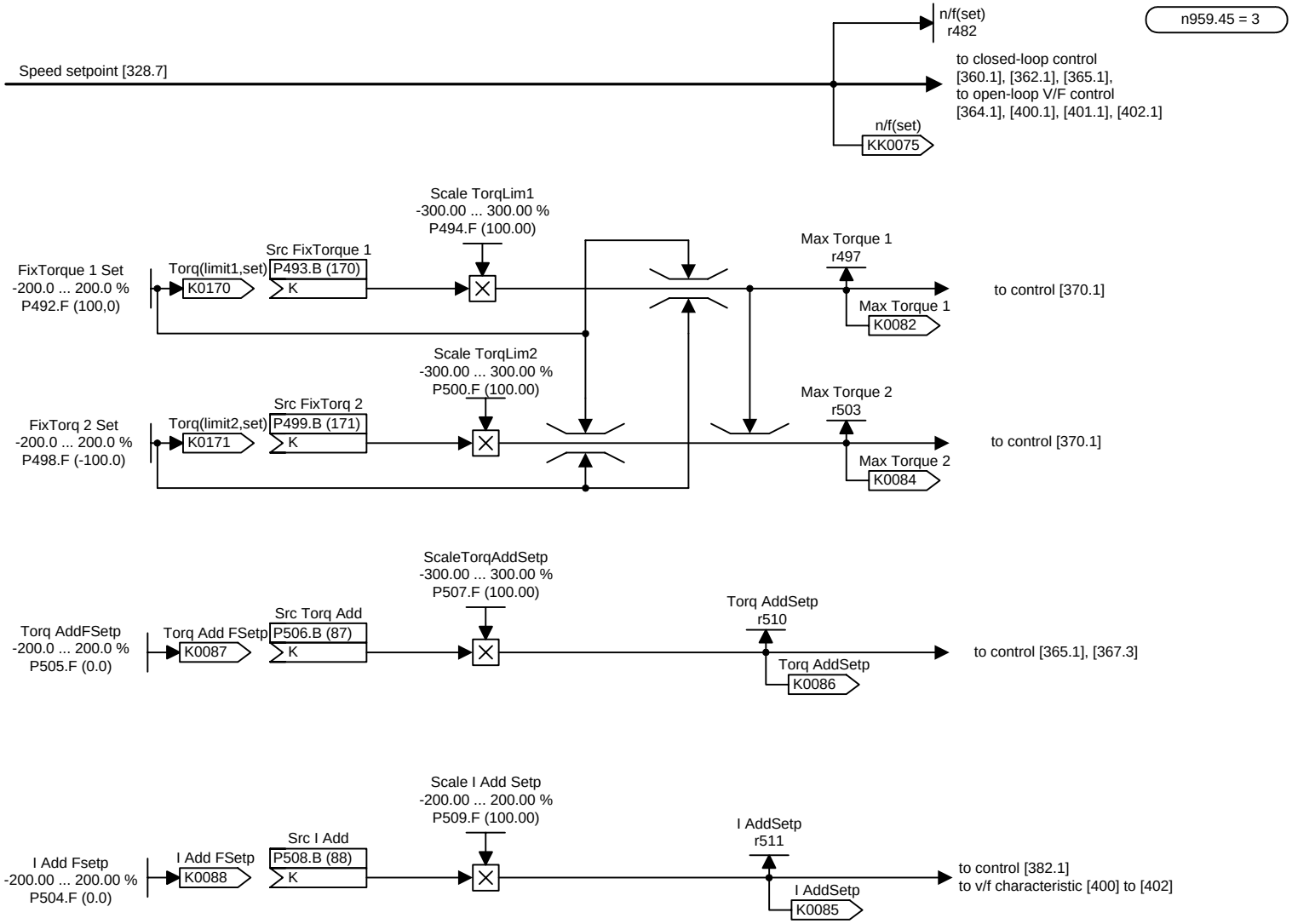
<1> Effective acceleration time:Tup_eff =Tup + (AR/2+ER/2)
Effective deceleration time:Tdn_eff =Tdn + (AR/2+ER/2)
<2> Rounding has an effect even for zero passage
<3> $T_v = T_{ab}$ · Connector value

1	2	3	4	5	6	7	8
Setpoint channel (Part 2)					fp_vc_327_e.vsd	Function diagram	- 327 -
Master drive + ramp function generator, lift and hoisting-gear applications (U800 = 1)					26.10.01	MASTERDRIVES VC	

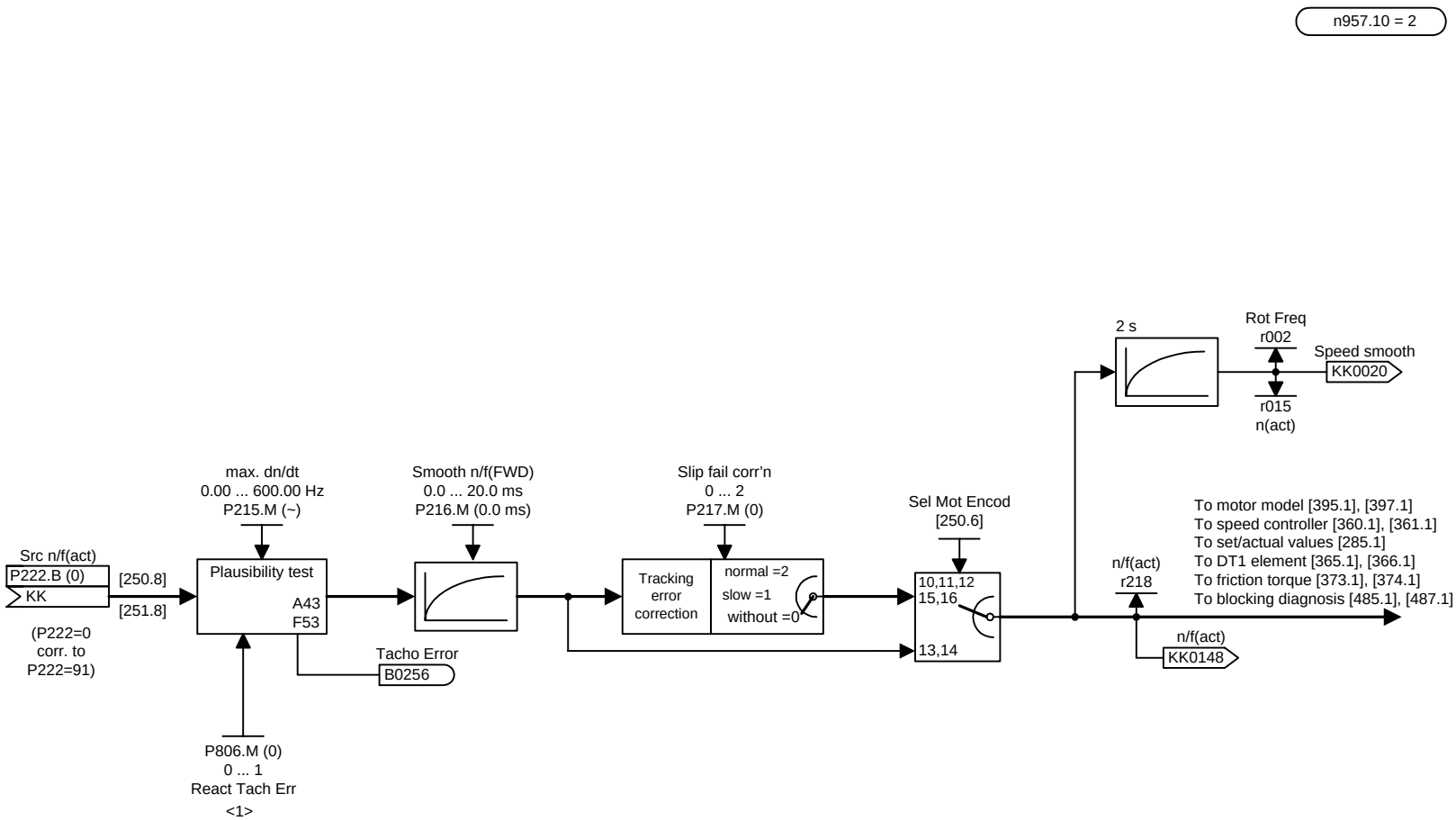


<1> not Compact PLUS

1	2	3	4	5	6	7	8
Setpoint channel (part 3)					fp_vc_328_e.vsd	Function diagram	- 328 -
Master drive, lift and hoisting-gear applications (U800 = 1)					26.10.01	MASTERDRIVES VC	

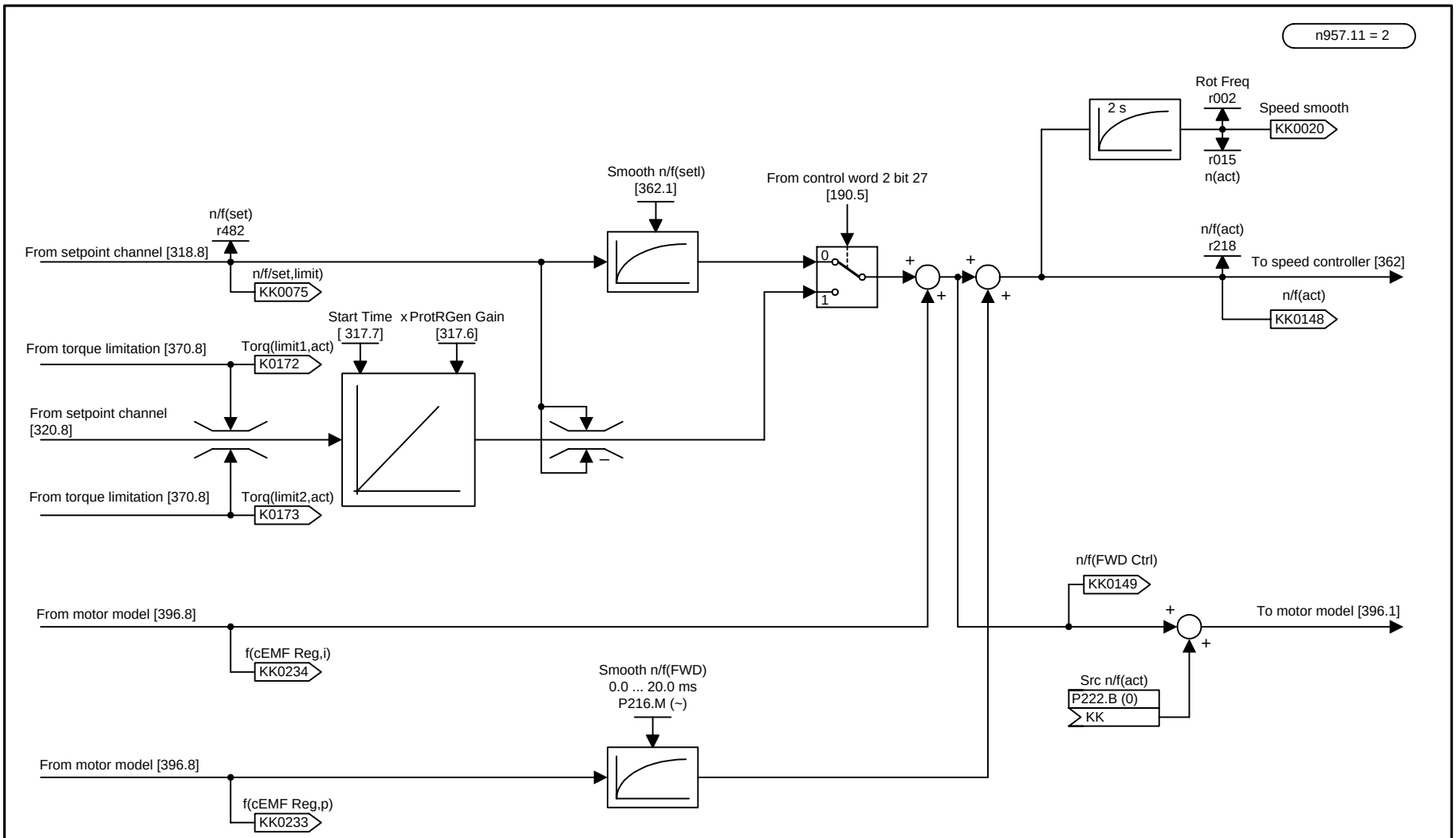


1	2	3	4	5	6	7	8
Setpoint channel (part 4)					fp_vc_329_e.vsd	Function diagram	- 329 -
Master drive, lift and hoisting-gear applications (U800 = 1)					26.10.01	MASTERDRIVES VC	



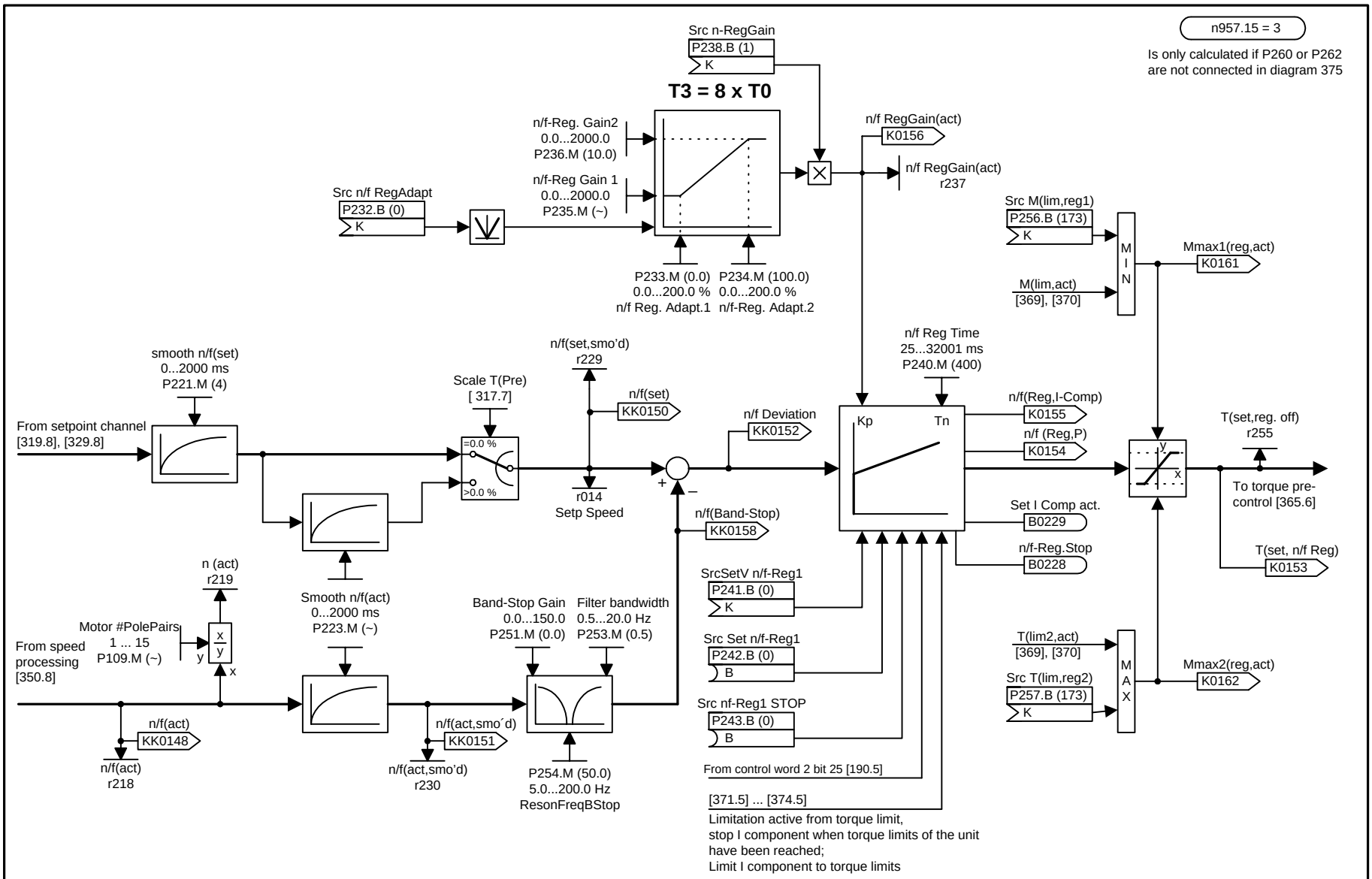
<1> Only in the case of n-control (P100 = 4)
Not in the case of synch. motor (P95=12)

1	2	3	4	5	6	7	8
Speed/position processing					fp_vc_350_e.vsd	Function diagram	- 350 -
Speed/torque control, master/slave drive					31.01.98	MASTERDRIVES VC	

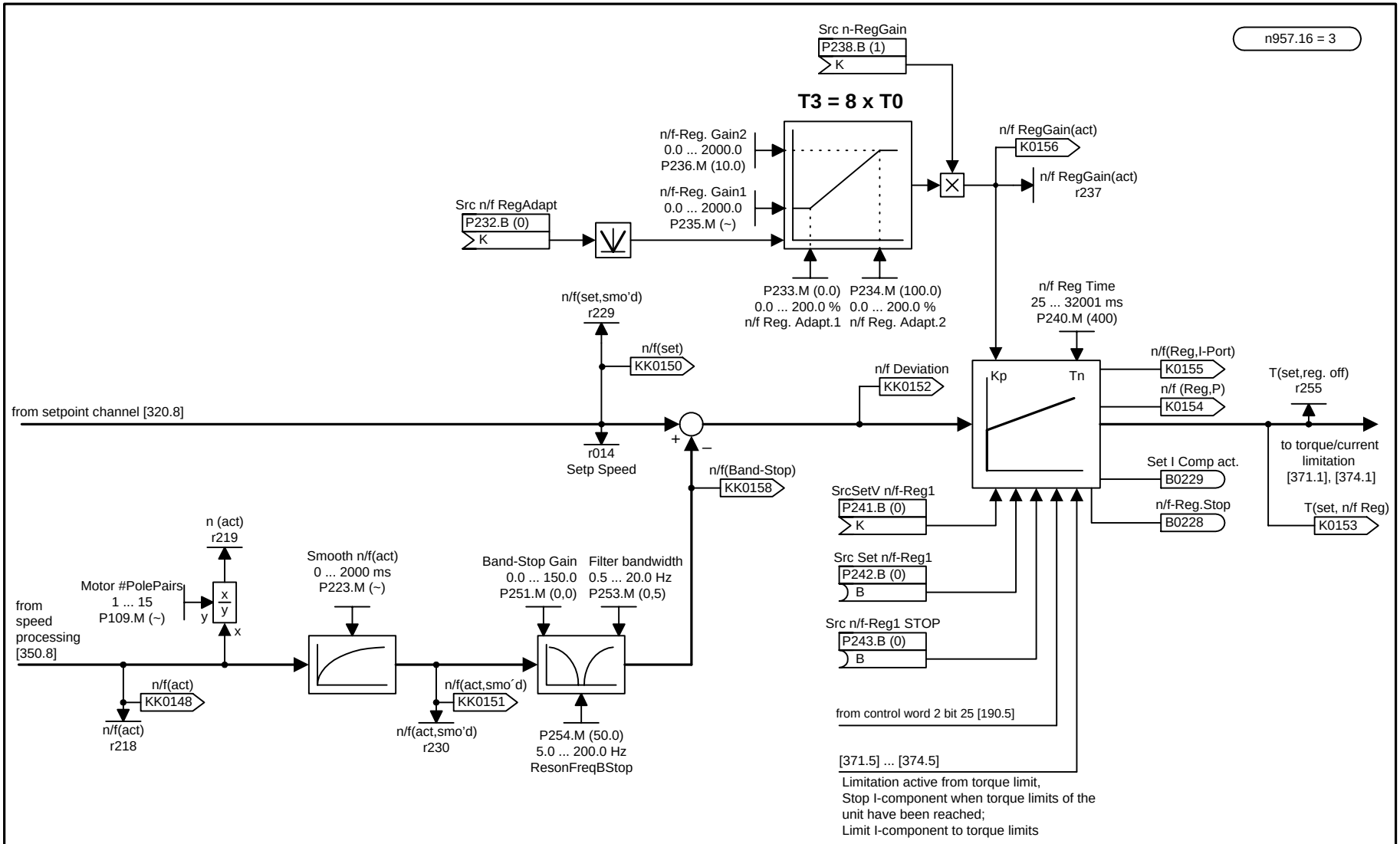


1	2	3	4	5	6	7	8
Speed processing					fp_vc_351_e.vsd	Function diagram	- 351 -
Frequency control, master/slave drive					31.01.98	MASTERDRIVES VC	

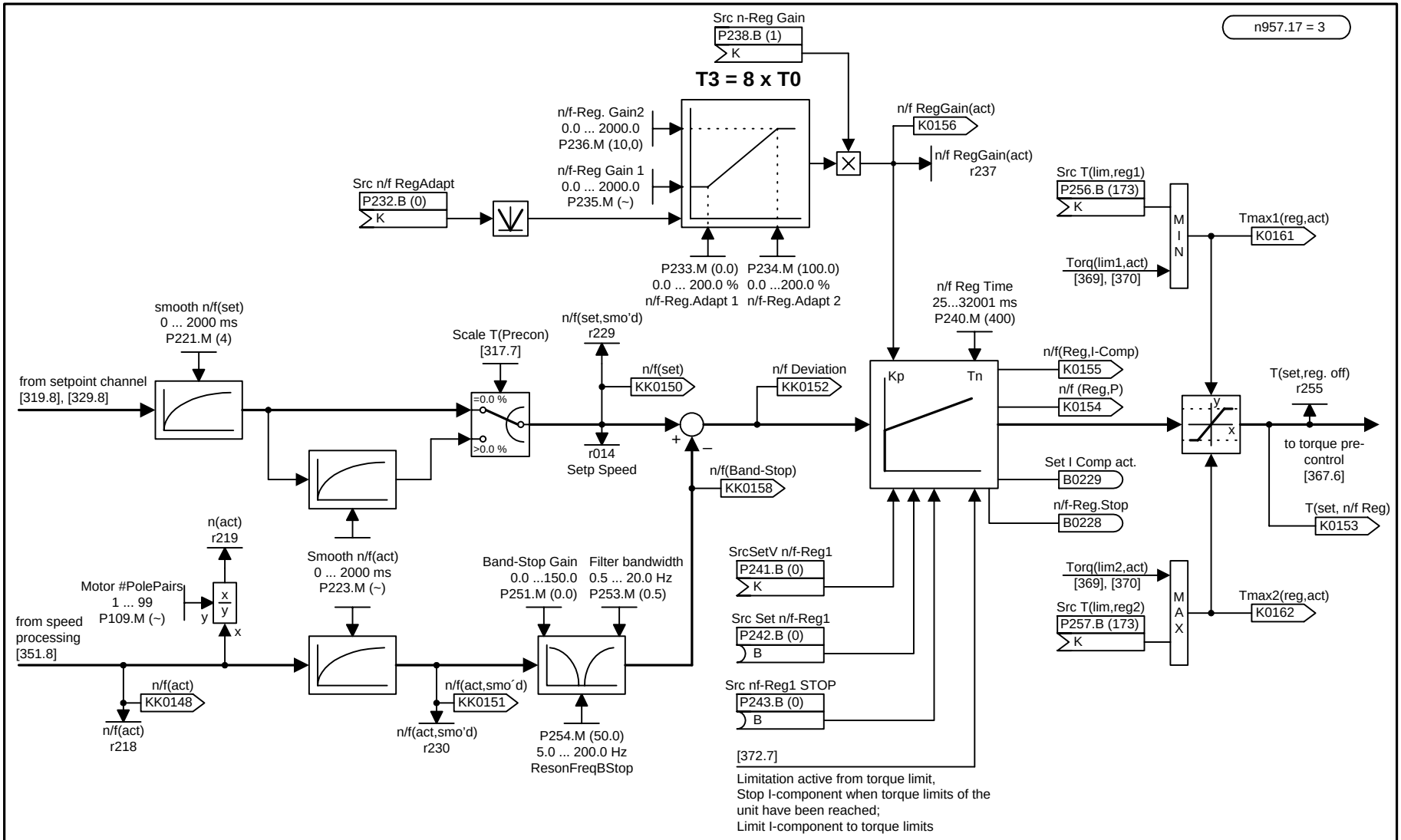
1	2	3	4	5	6	7	8
Speed/position processing					fp_vc_352_e.vsd	Function diagram	- 352 -
v/f characteristic with speed controller					31.01.98	MASTERDRIVES VC	



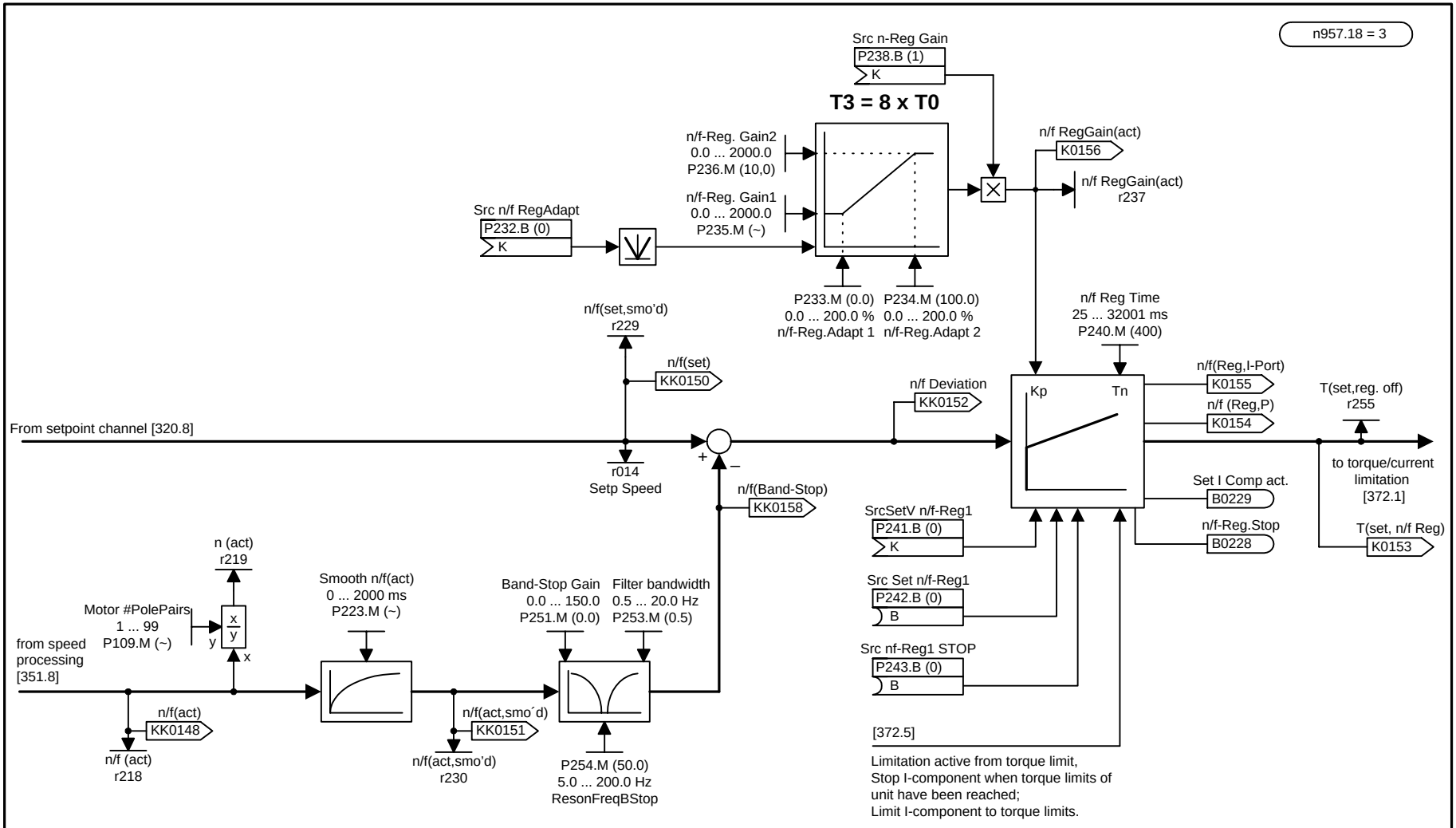
1	2	3	4	5	6	7	8
Speed controller					fp_vc_360_e.vsd	Function diagram	- 360 -
Speed control, master drive					09.04.98	MASTERDRIVES VC	



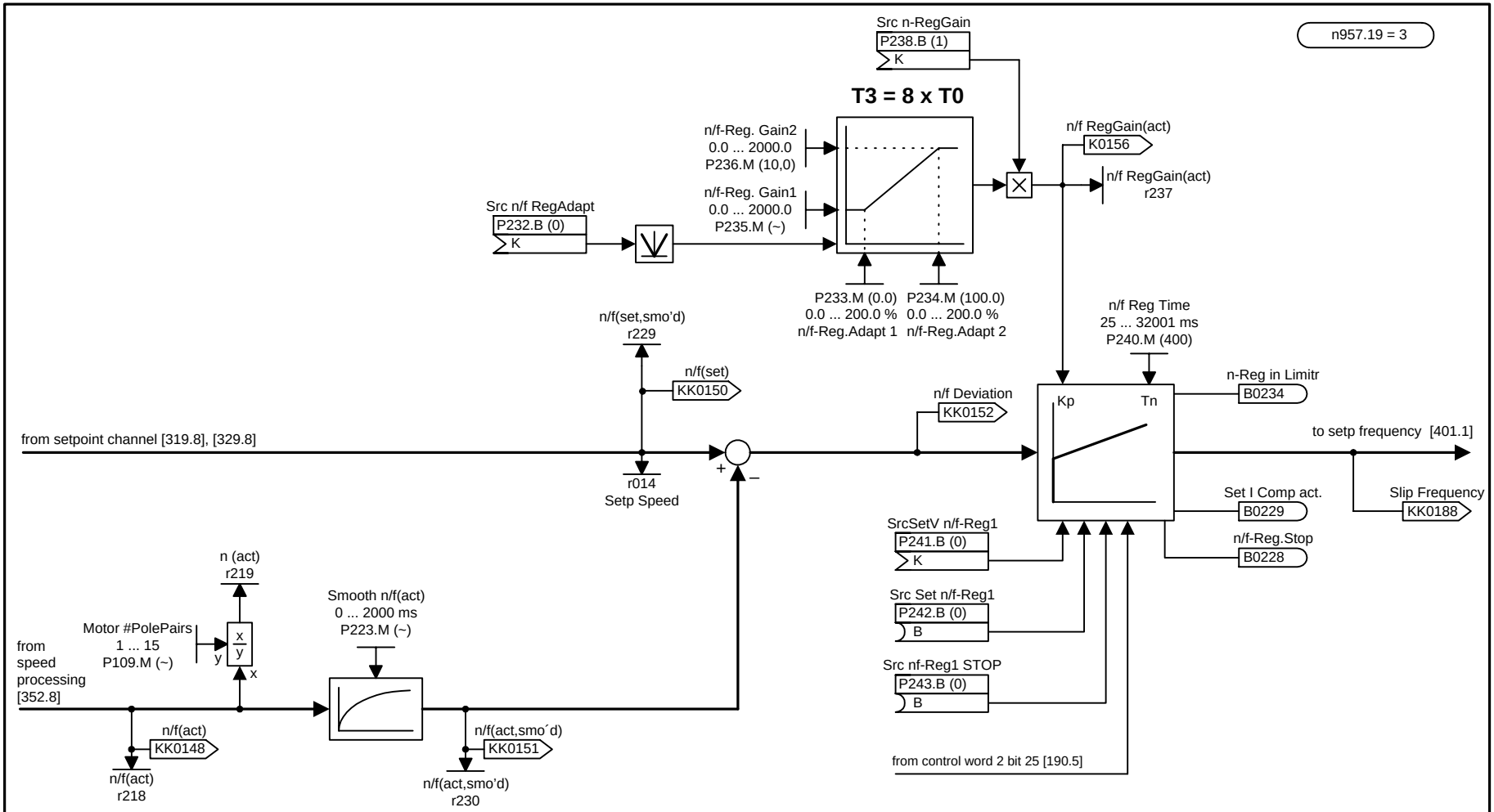
1	2	3	4	5	6	7	8
Speed limiting controller					fp_vc_361_e.vsd	Function diagram	- 361 -
Torque control and speed control/slave drive					09.04.98	MASTERDRIVES VC	



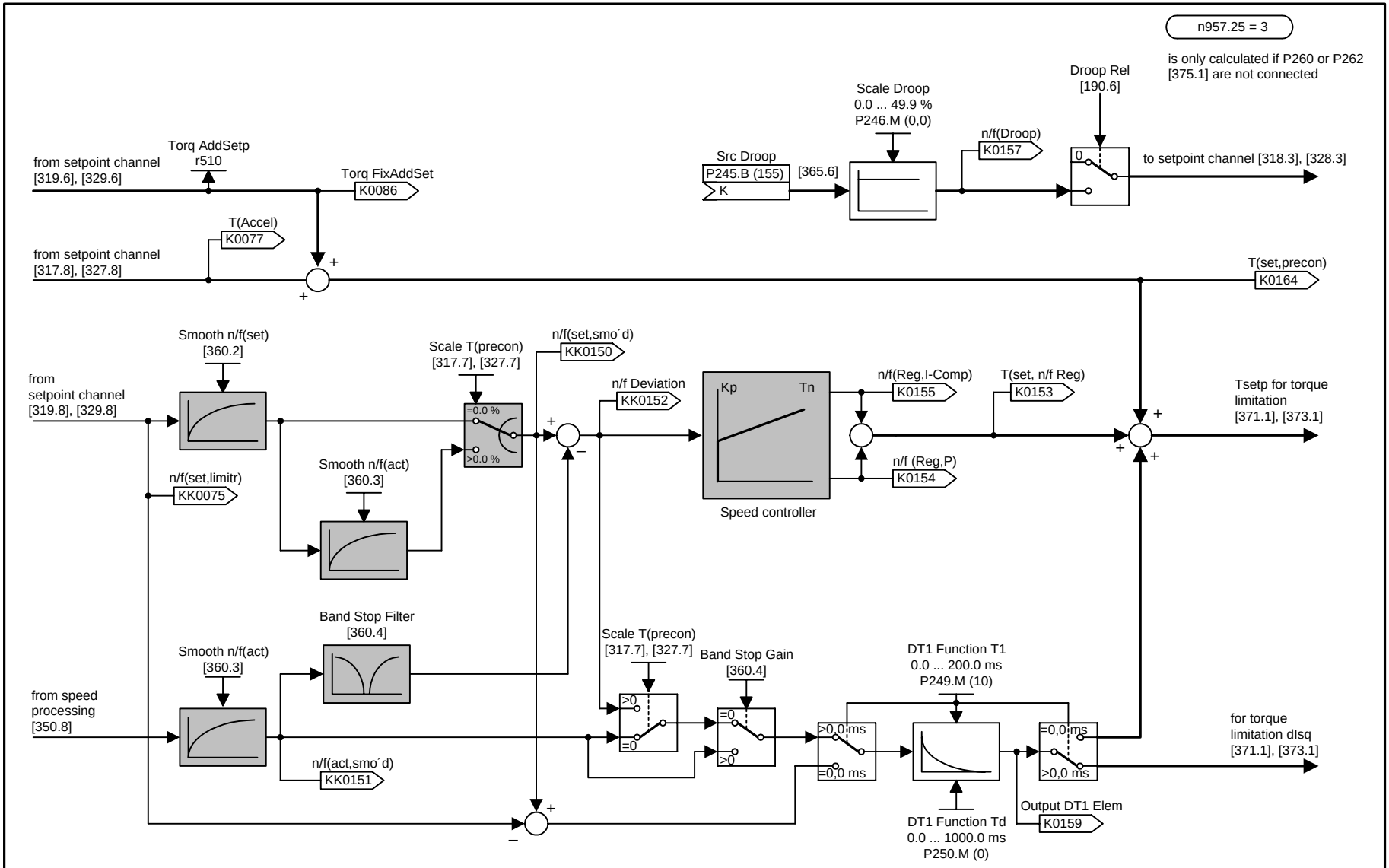
1	2	3	4	5	6	7	8
Speed controller					fp_vc_362_e.vsd	Function diagram	- 362 -
Frequency control, master drive					09.04.98	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
Speed limiting controller					fp_vc_363_e.vsd	Function diagram	- 363 -
Frequency control, slave drive					09.04.98	MASTERDRIVES VC	

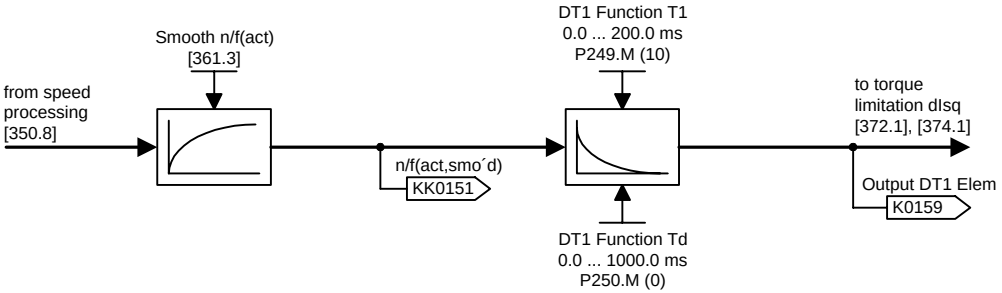


1	2	3	4	5	6	7	8
Speed controller					fp_vc_364_e.vsd	Function diagram	- 364 -
V/f characteristic with speed controller					09.04.98	MASTERDRIVES VC	

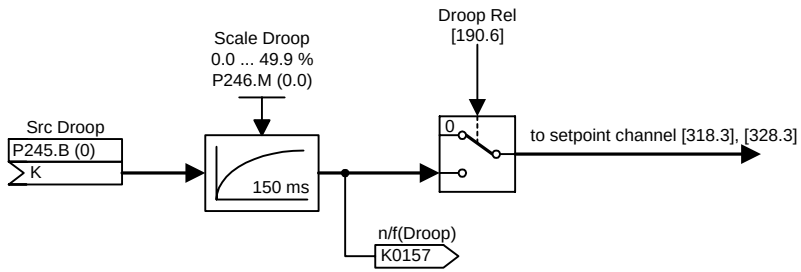


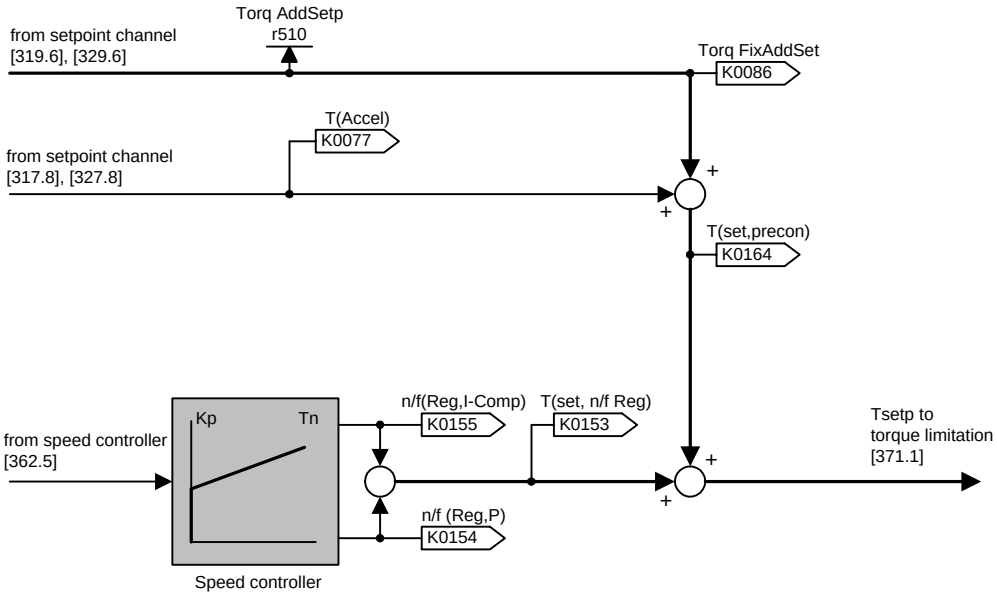
1	2	3	4	5	6	7	8
DT1 element, droop and torque pre-control					fp_vc_365_e.vsd	Function diagram	- 365 -
Speed control, master drive					09.04.98	MASTERDRIVES VC	

n957.26 = 3


Smooth n/f(act)
[361.3]
from speed
processing
[350.8]
n/f(act,smo´d)
KK0151
DT1 Function T1
0.0 ... 200.0 ms
P249.M (10)
DT1 Function Td
0.0 ... 1000.0 ms
P250.M (0)
to torque
limitation dIsq
[372.1], [374.1]
Output DT1 Elem
K0159

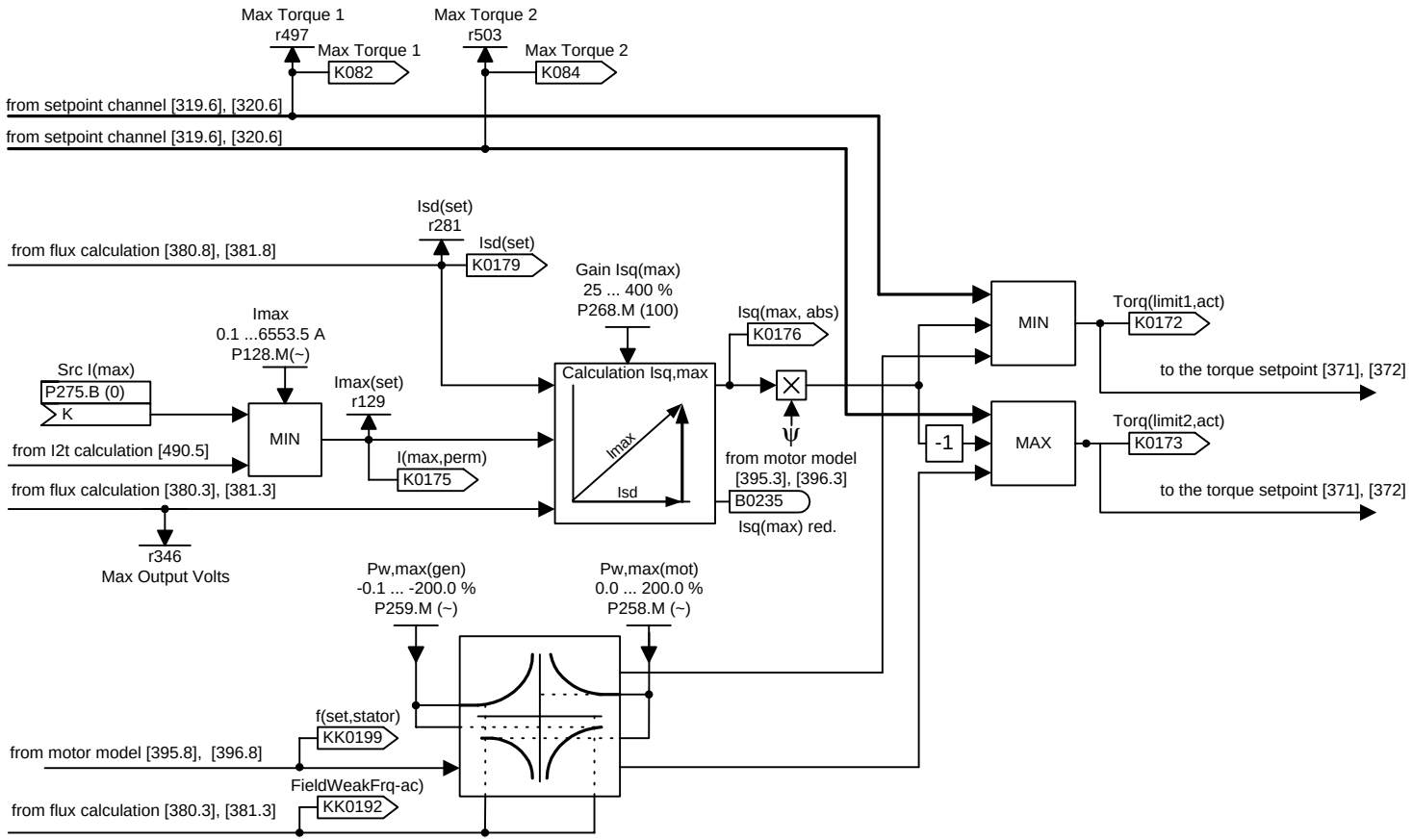
n957.27 = 3



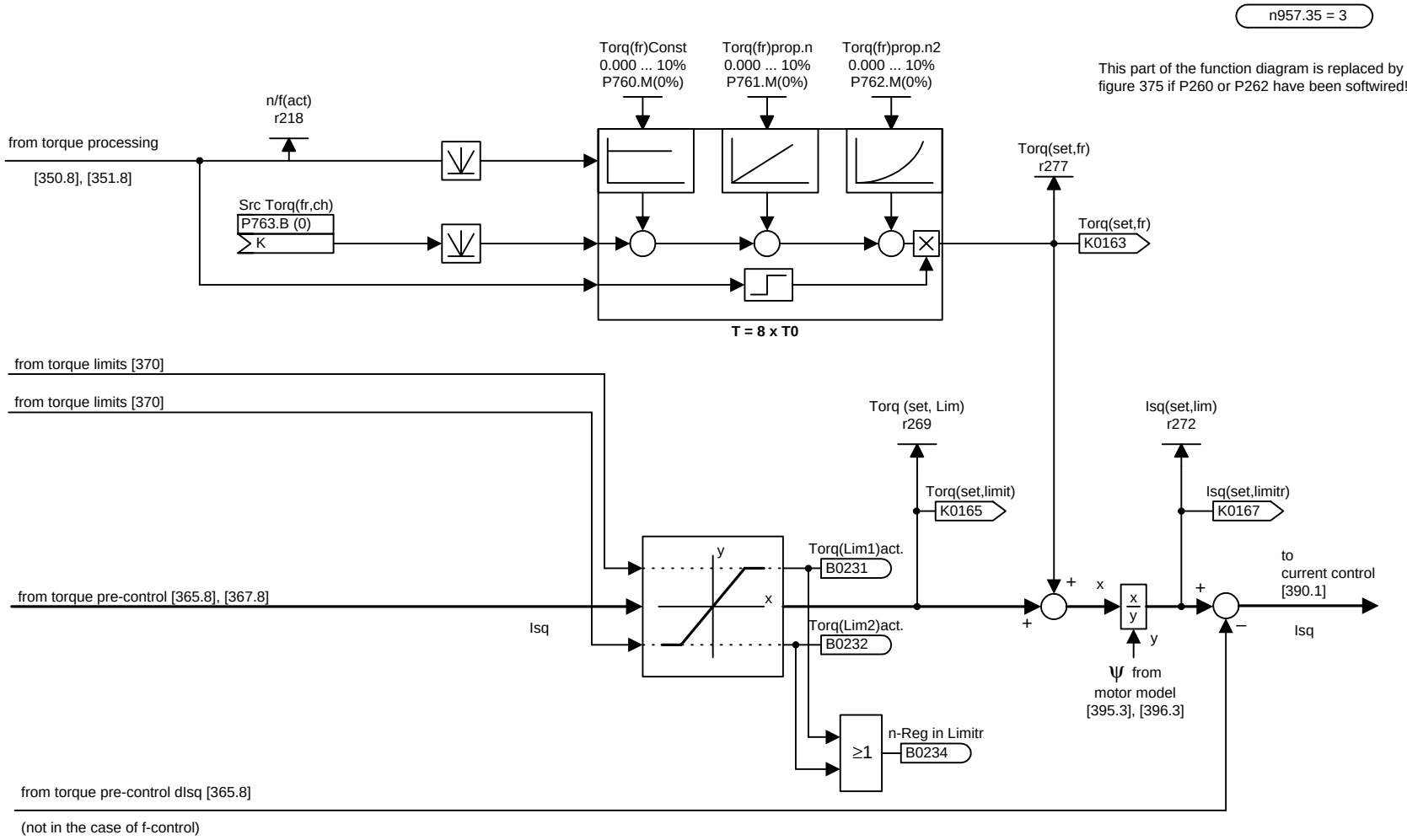


1	2	3	4	5	6	7	8
Droop and torque pre-control					fp_vc_367_e.vsd	Function diagram	- 367 -
Frequency control, master drive					31.01.98	MASTERDRIVES VC	

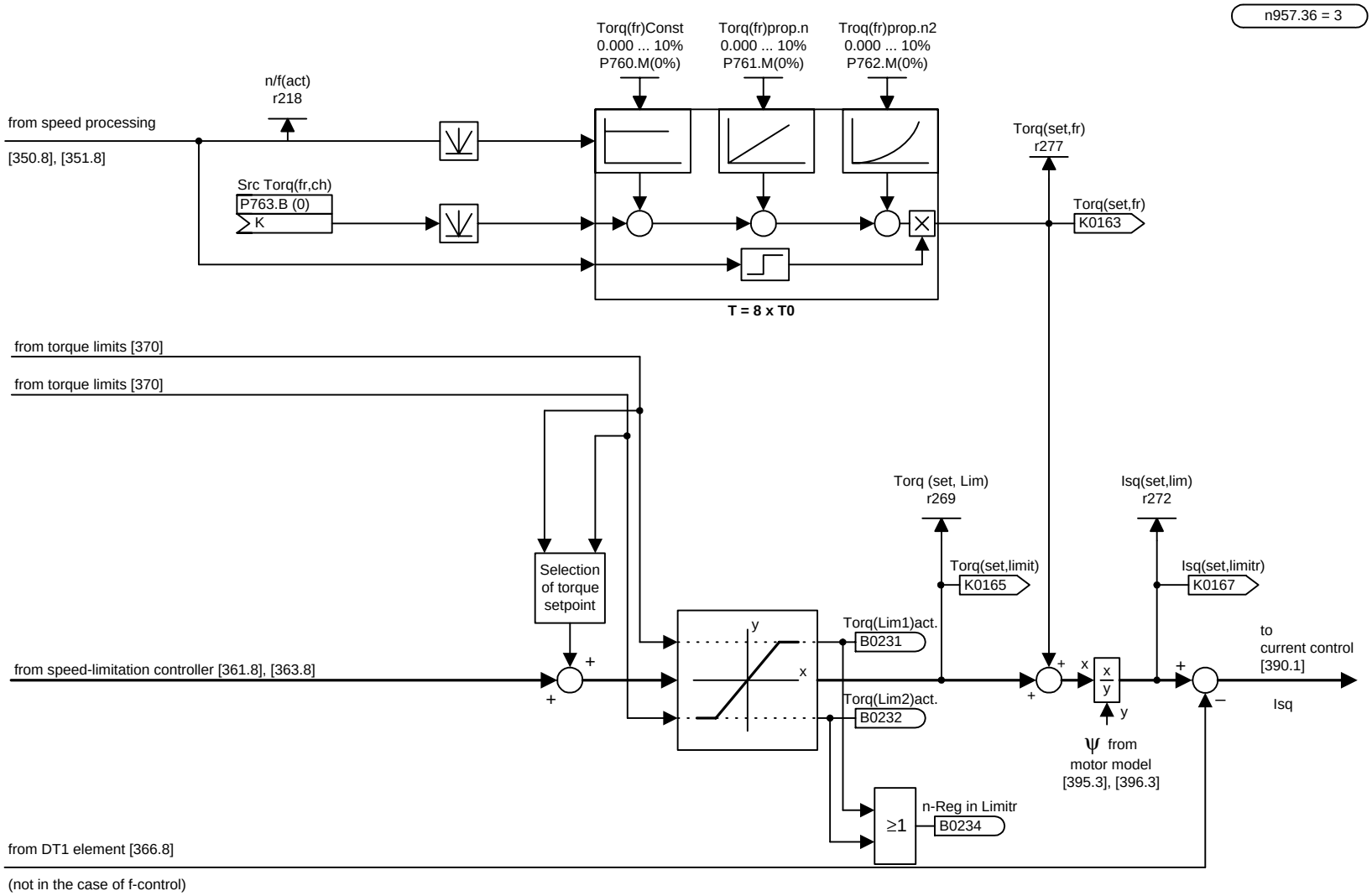
n957.30 = 3



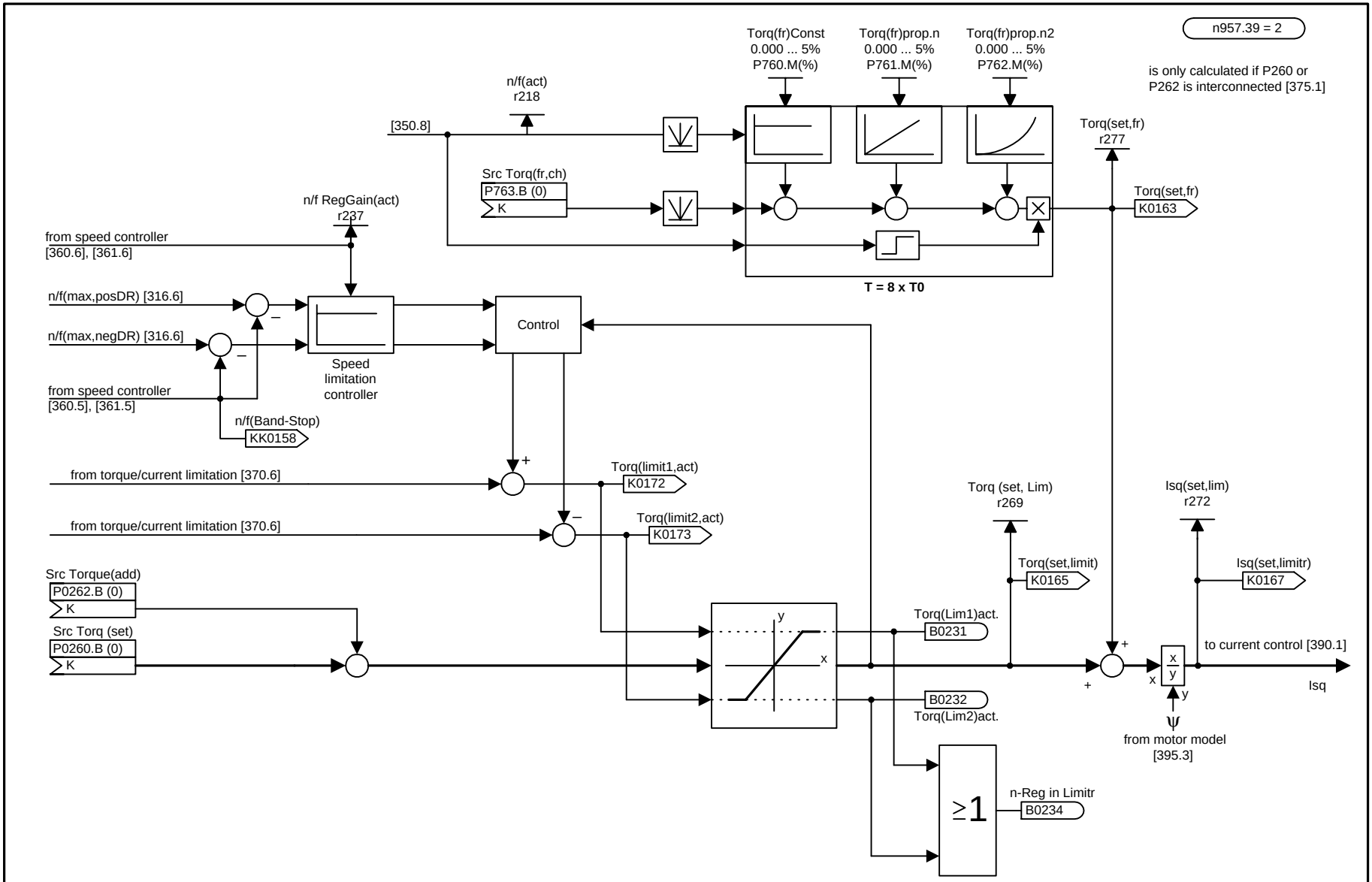
1	2	3	4	5	6	7	8
Torque/current limitation					fp_vc_370_e.vsd	Function diagram	- 370 -
n/f/T control, master/slave drive					31.01.98	MASTERDRIVES VC	



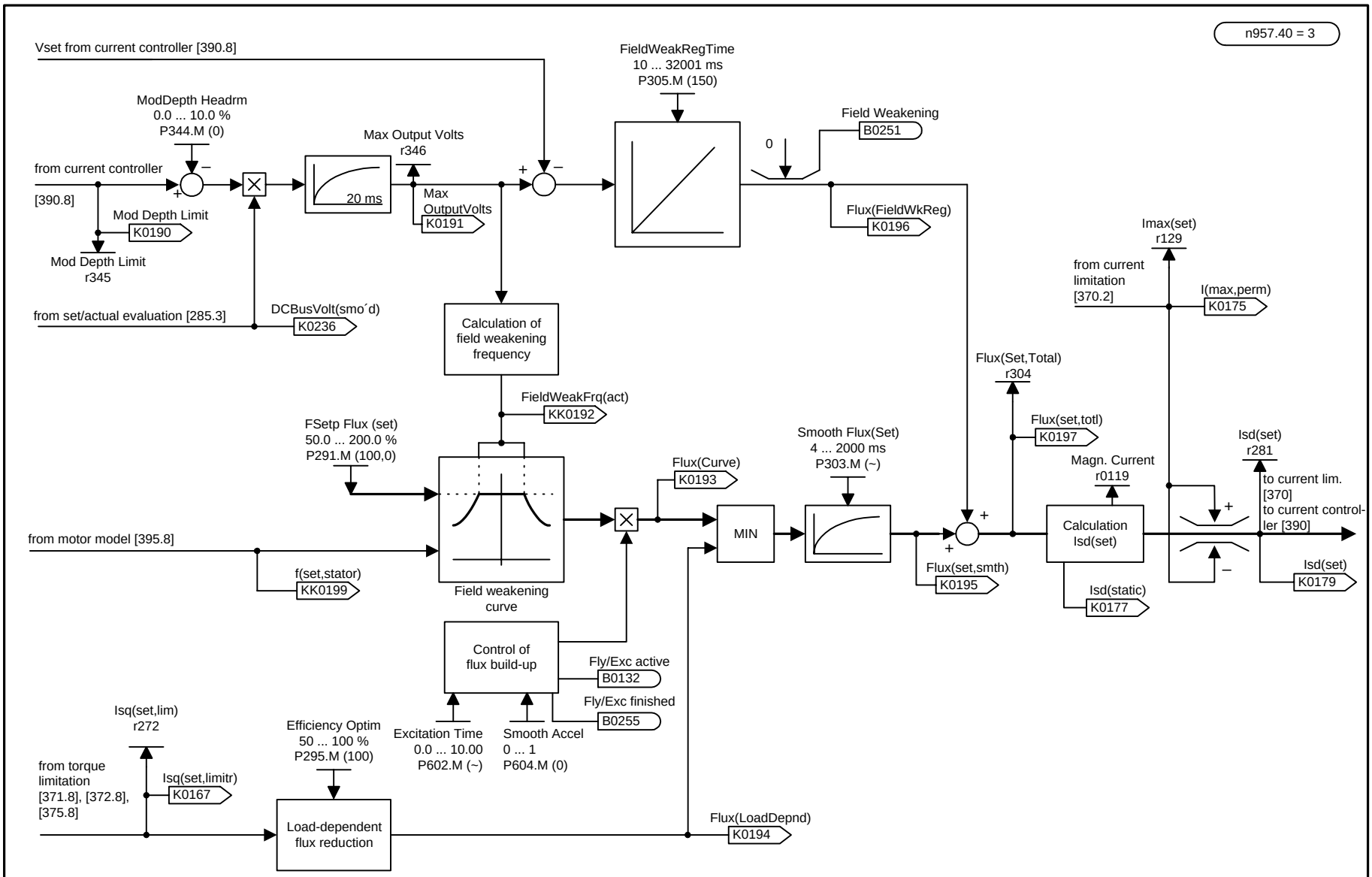
1	2	3	4	5	6	7	8
Torque setpoint					fp_vc_371_e.vsd	Function diagram	- 371 -
n/f-control, master drive					27.01.99	MASTERDRIVES VC	



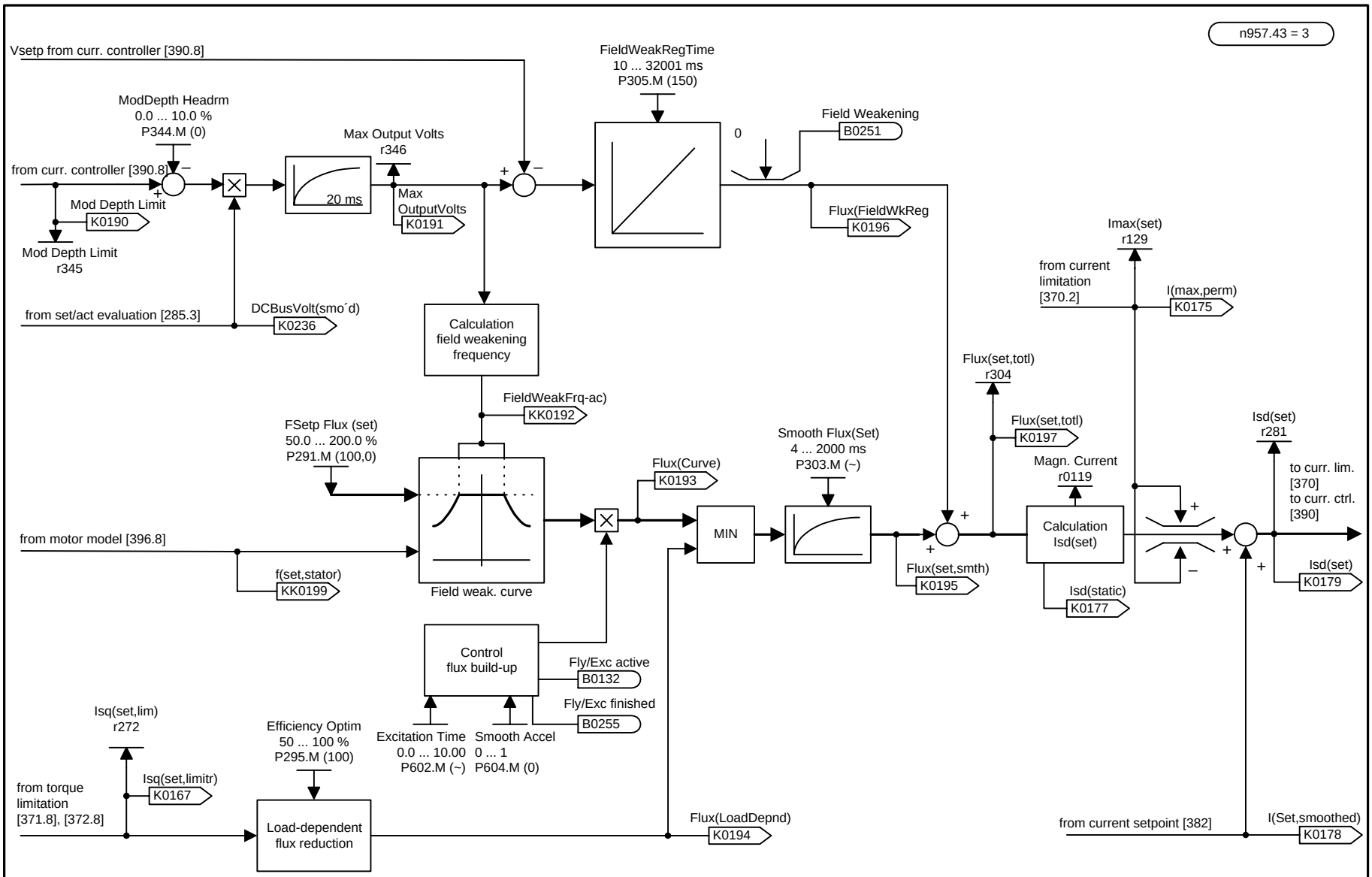
1	2	3	4	5	6	7	8
Torque setpoint					fp_vc_372_e.vsd	Function diagram	- 372 -
T control and n/f control, slave drive					22.09.98	MASTERDRIVES VC	



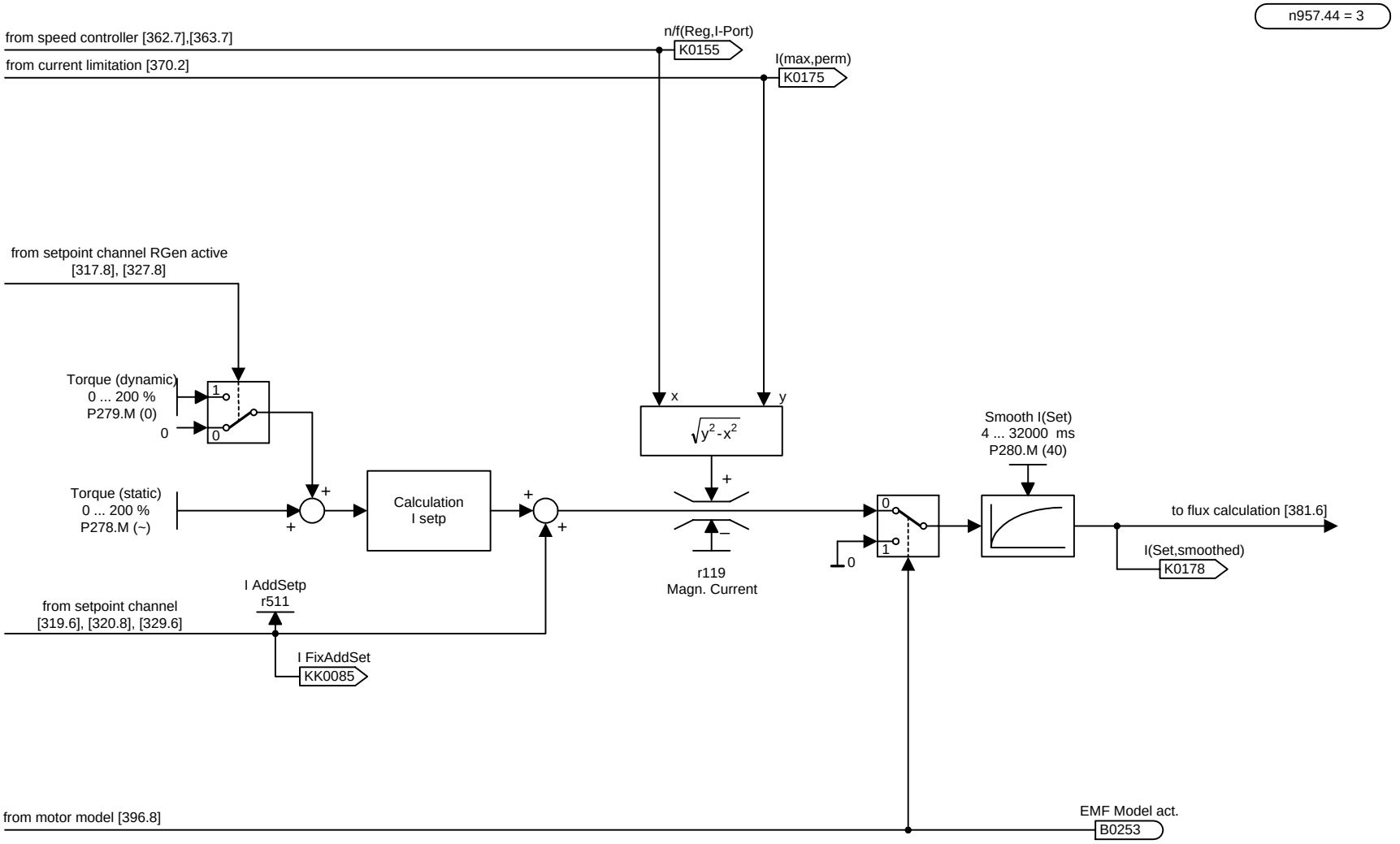
1	2	3	4	5	6	7	8
Fast torque setpoint					fp_vc_375_e.vsd	Function diagram	- 375 -
Speed control, master drive					31.01.98	MASTERDRIVES VC	



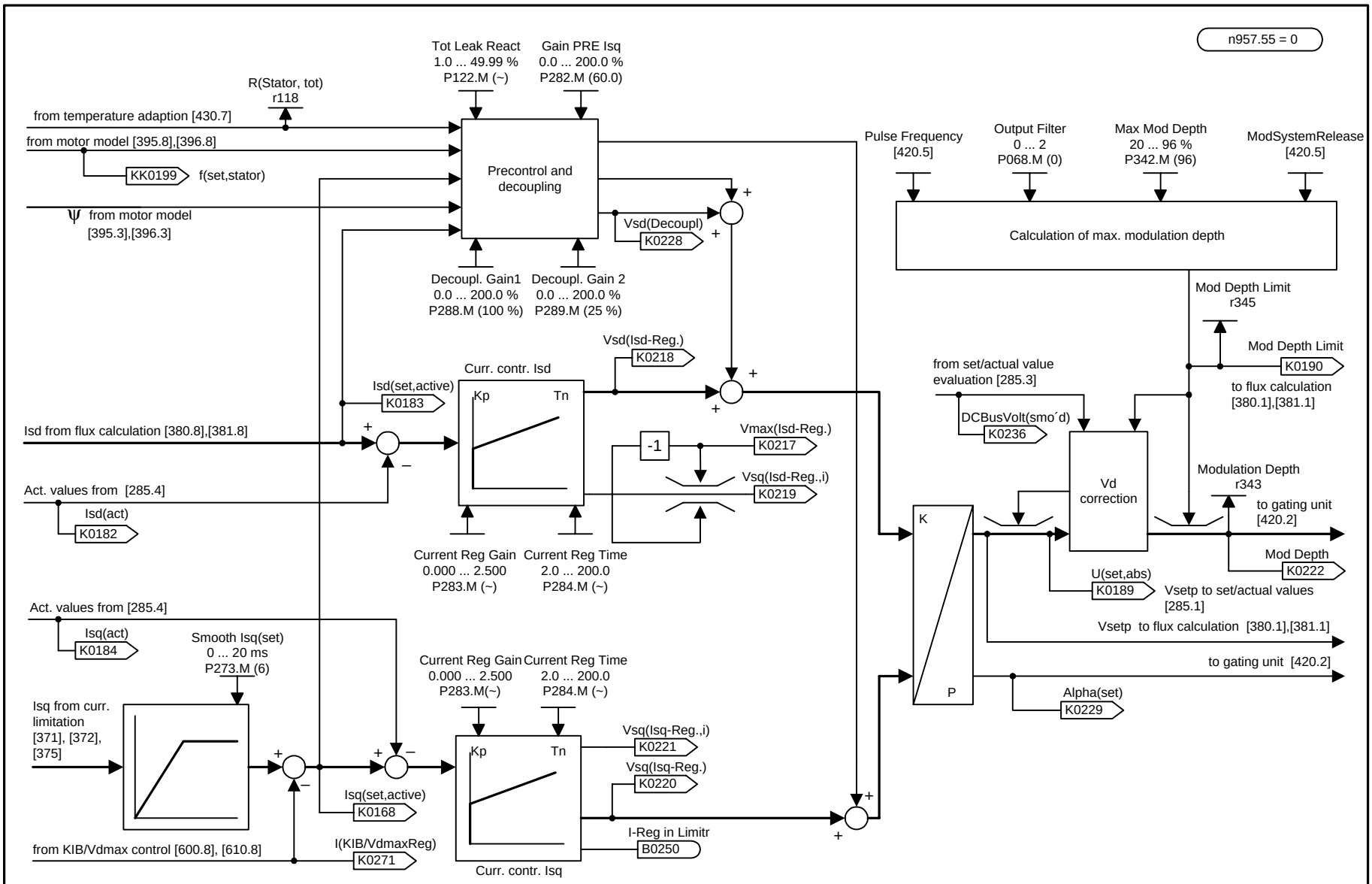
1	2	3	4	5	6	7	8
Flux calculation					fp_vc_380_e.vsd	Function diagram	- 380 -
n/T-control, master/slave drive					09.04.98	MASTERDRIVES VC	



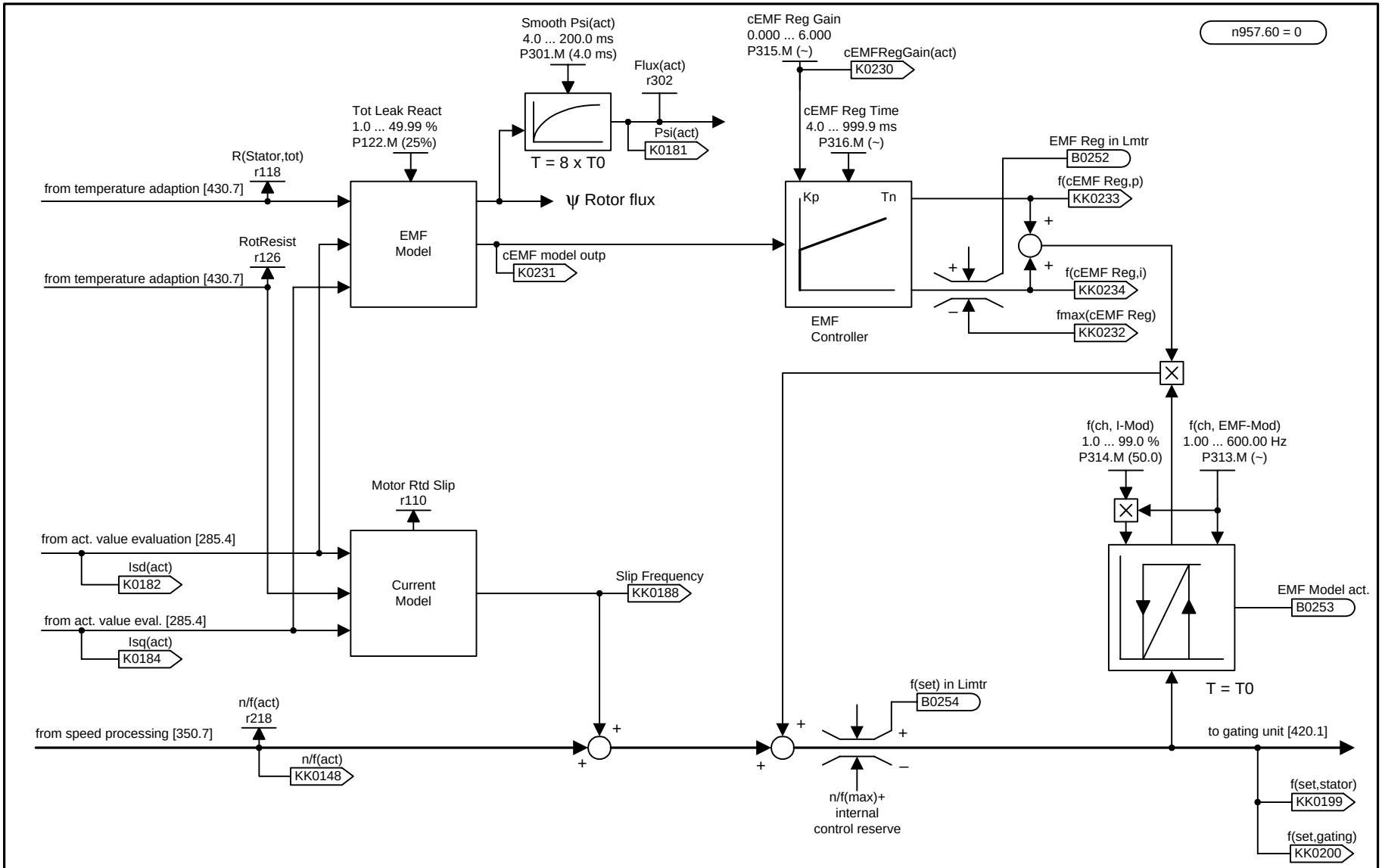
1	2	3	4	5	6	7	8
Flux calculation					fp_vc_381_e.vsd	Function diagram	- 381 -
Frequency control, master/slave drive					09.04.98	MASTERDRIVES VC	



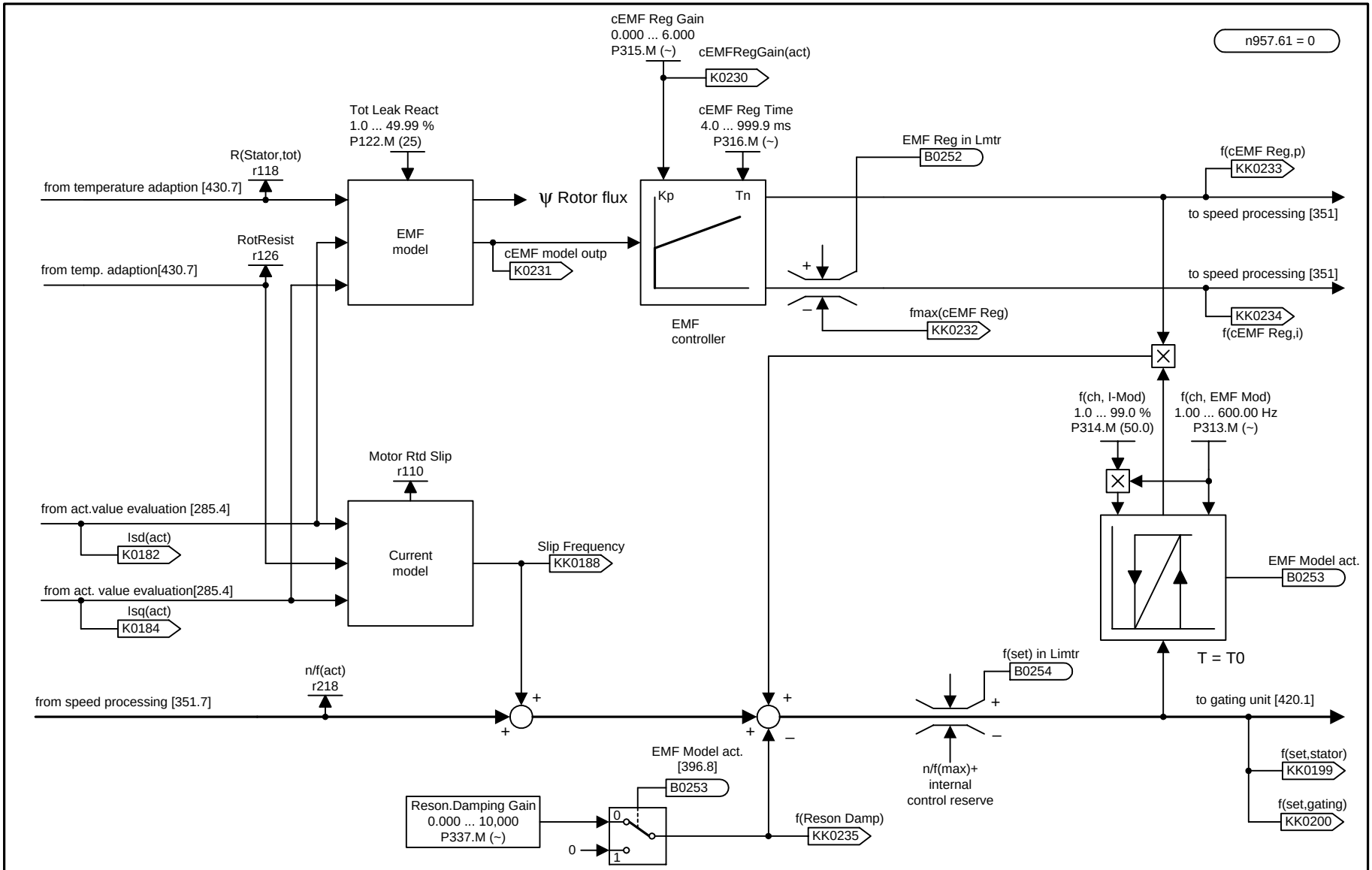
1	2	3	4	5	6	7	8
Current setpoint					fp_vc_382_e.vsd	Function diagram	- 382-
Frequency control, master/slave drive					16.02.98	MASTERDRIVES VC	



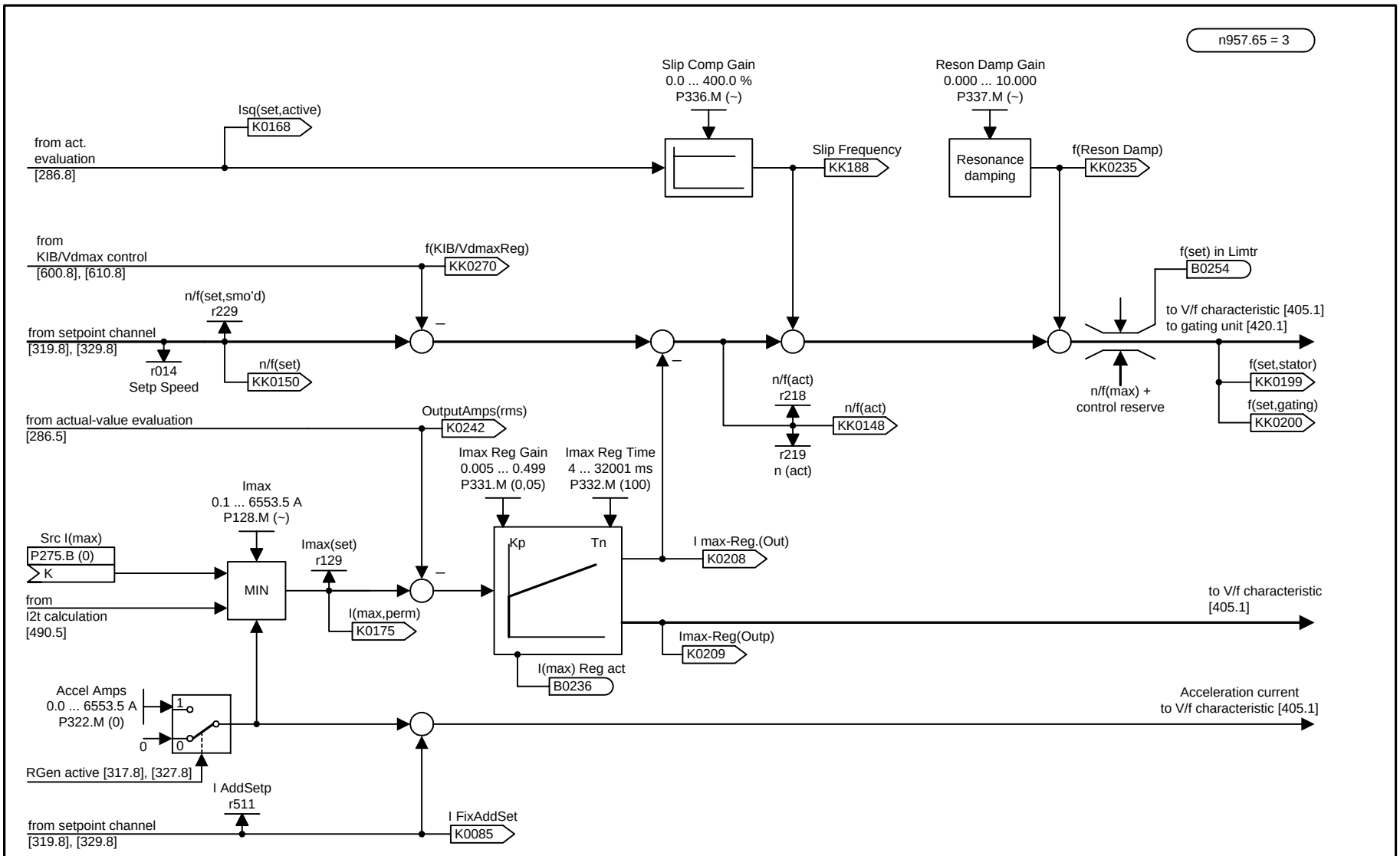
1	2	3	4	5	6	7	8
Current controller					fp_vc_390_e.vsd	Function diagram	- 390 -
n/f/T-control for master/slave drive					31.01.98	MASTERDRIVES VC	



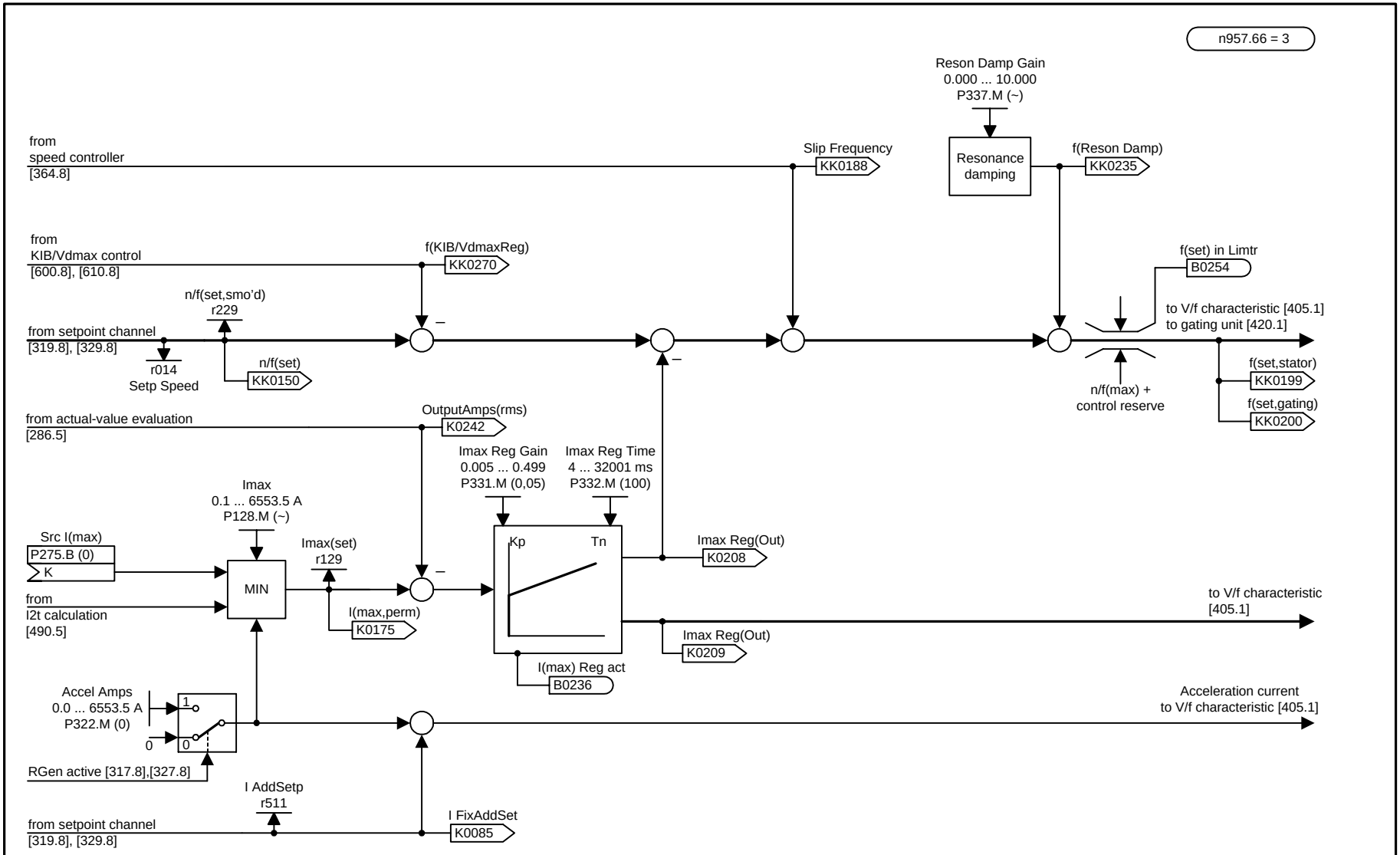
1	2	3	4	5	6	7	8
Motor model, frequency					fp_vc_395_e.vsd	Function diagram	- 395 -
Speed/torque control, master/slave drive					31.01.98	MASTERDRIVES VC	



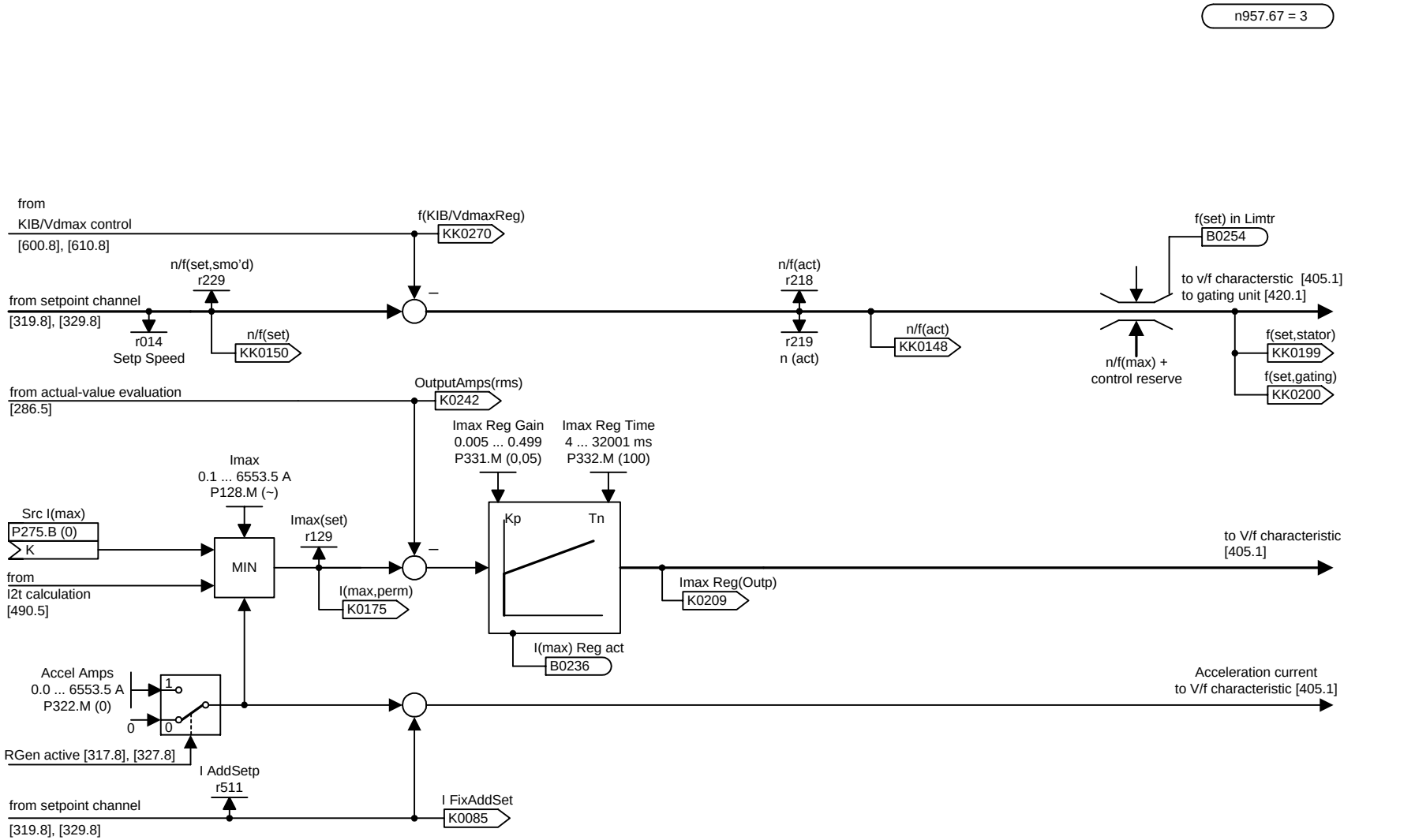
1	2	3	4	5	6	7	8
Motor model, frequency					fp_vc_396_e.vsd	Function diagram	- 396 -
Frequency control, master/slave drive					31.01.98	MASTERDRIVES VC	



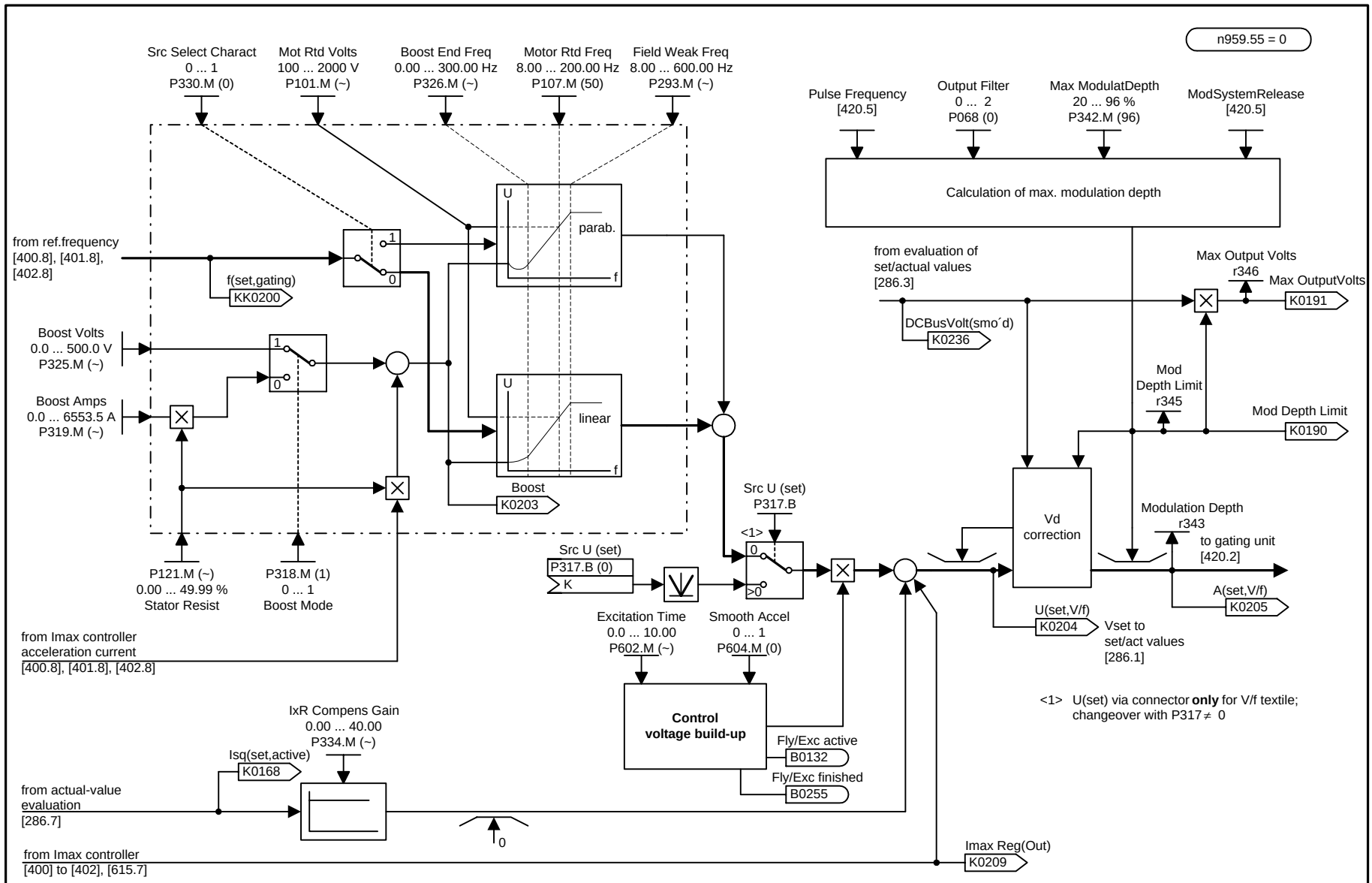
1	2	3	4	5	6	7	8
V/f open-loop control					fp_vc_400_e.vsd	Function diagram	- 400 -
Current limitation, V/f characteristic					31.01.98	MASTERDRIVES VC	



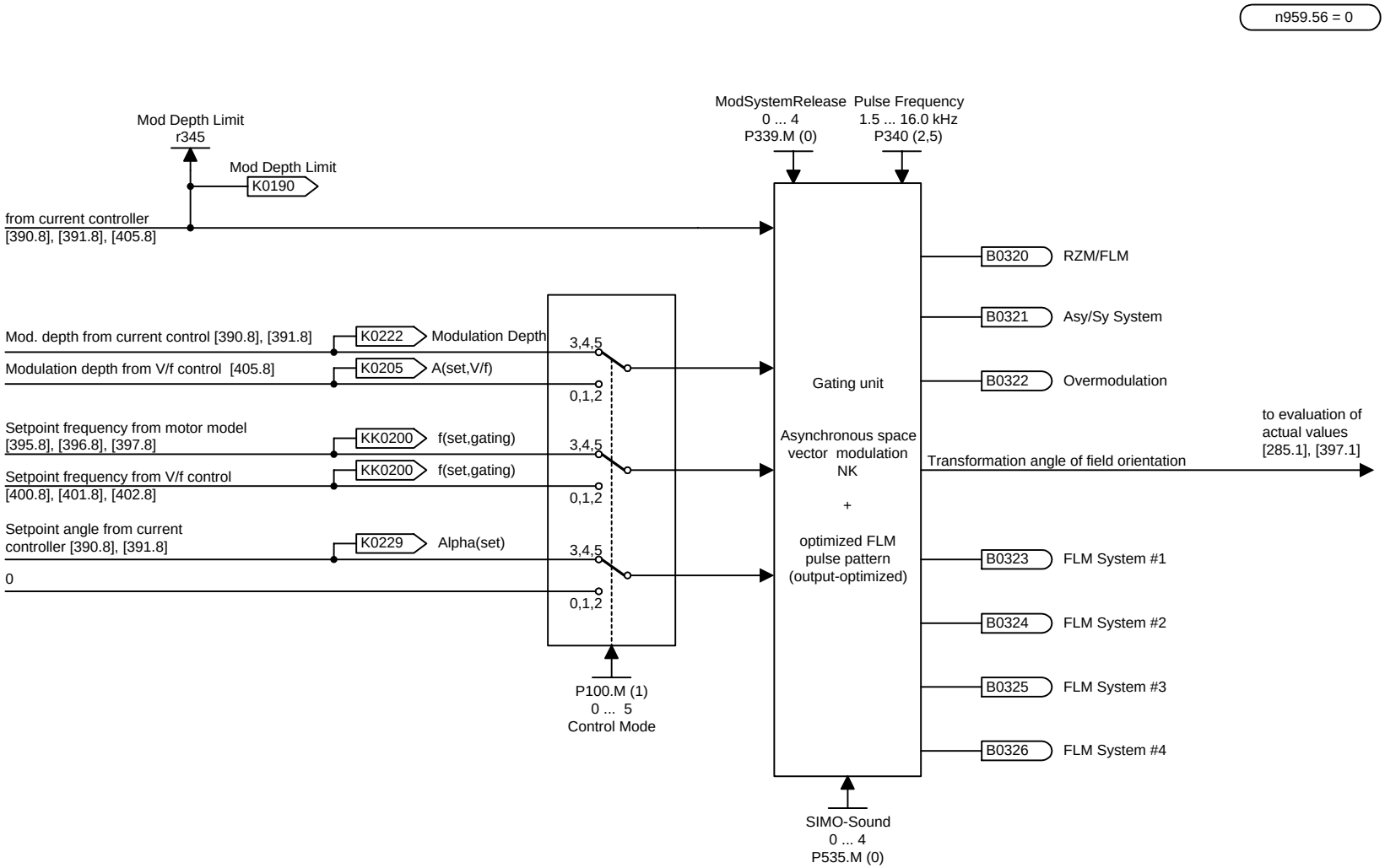
1	2	3	4	5	6	7	8
V/f open-loop control					fp_vc_401_e.vsd	Function diagram	- 401 -
Current limitation, V/f characteristic with speed controller					31.01.98	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
V/f open-loop control, textile					fp_vc_402_e.vsd	Function diagram	- 402 -
Setpoint frequency, current limiting controller					31.01.98	MASTERDRIVES VC	

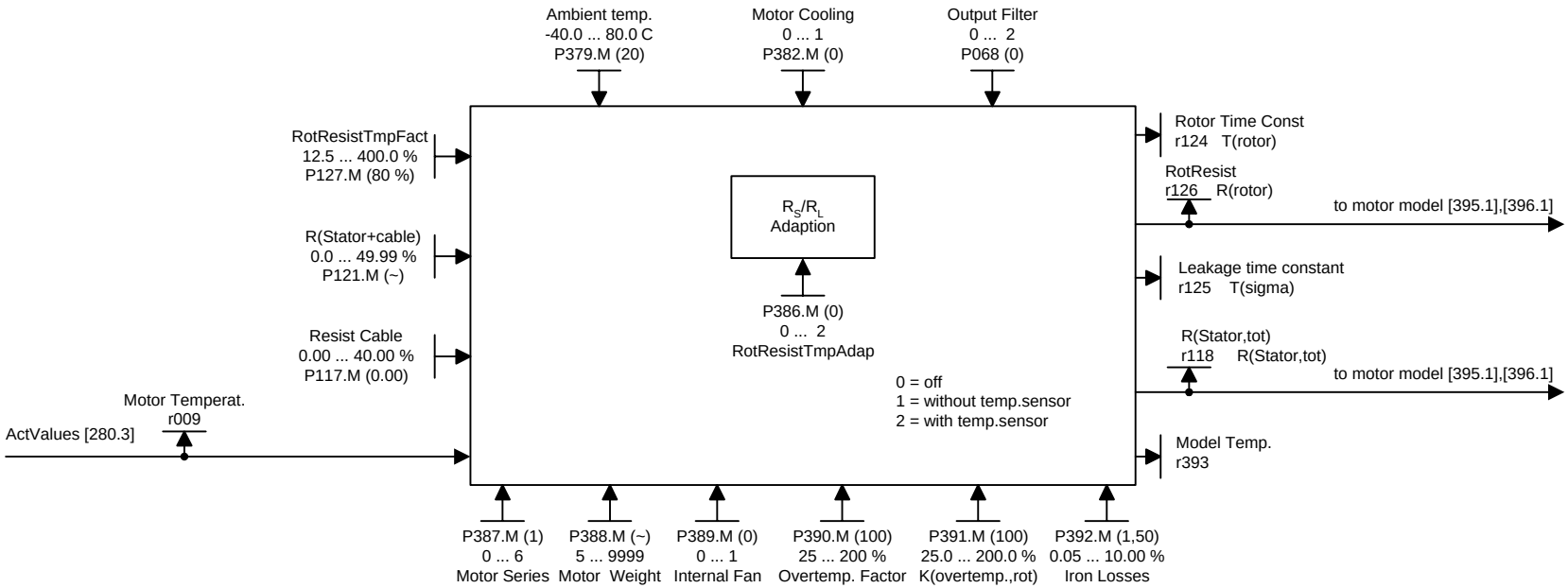


1	2	3	4	5	6	7	8
V/f open-loop control					fp_vc_405_e.vsd	Function diagram	- 405 -
V/f characteristic, Vd correction					09.04.98	MASTERDRIVES VC	

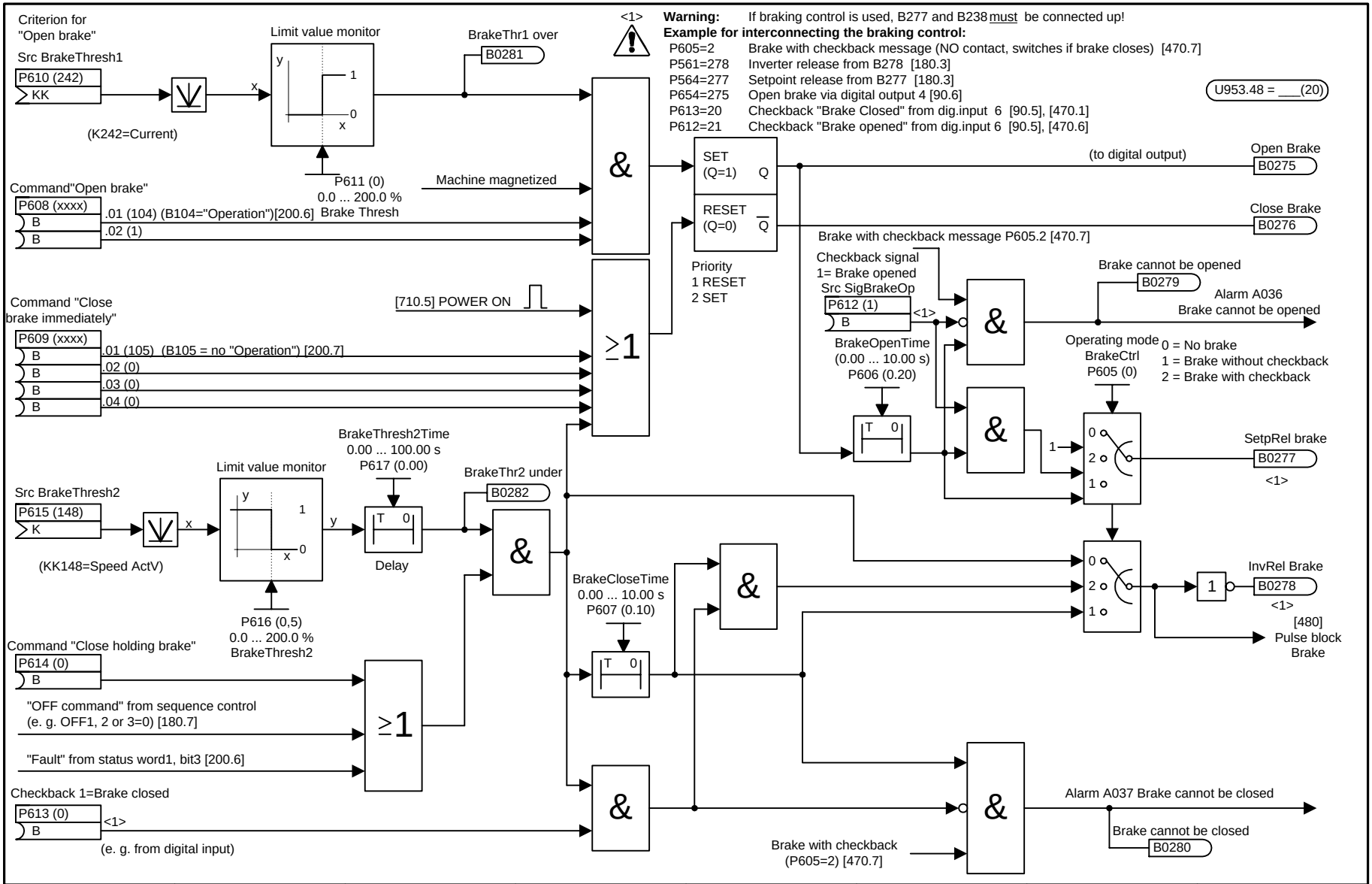


1	2	3	4	5	6	7	8
Gating unit					fp_vc_420_e.vsd	Function diagram	- 420 -
All open-loop and closed-loop control modes					31.01.98	MASTERDRIVES VC	

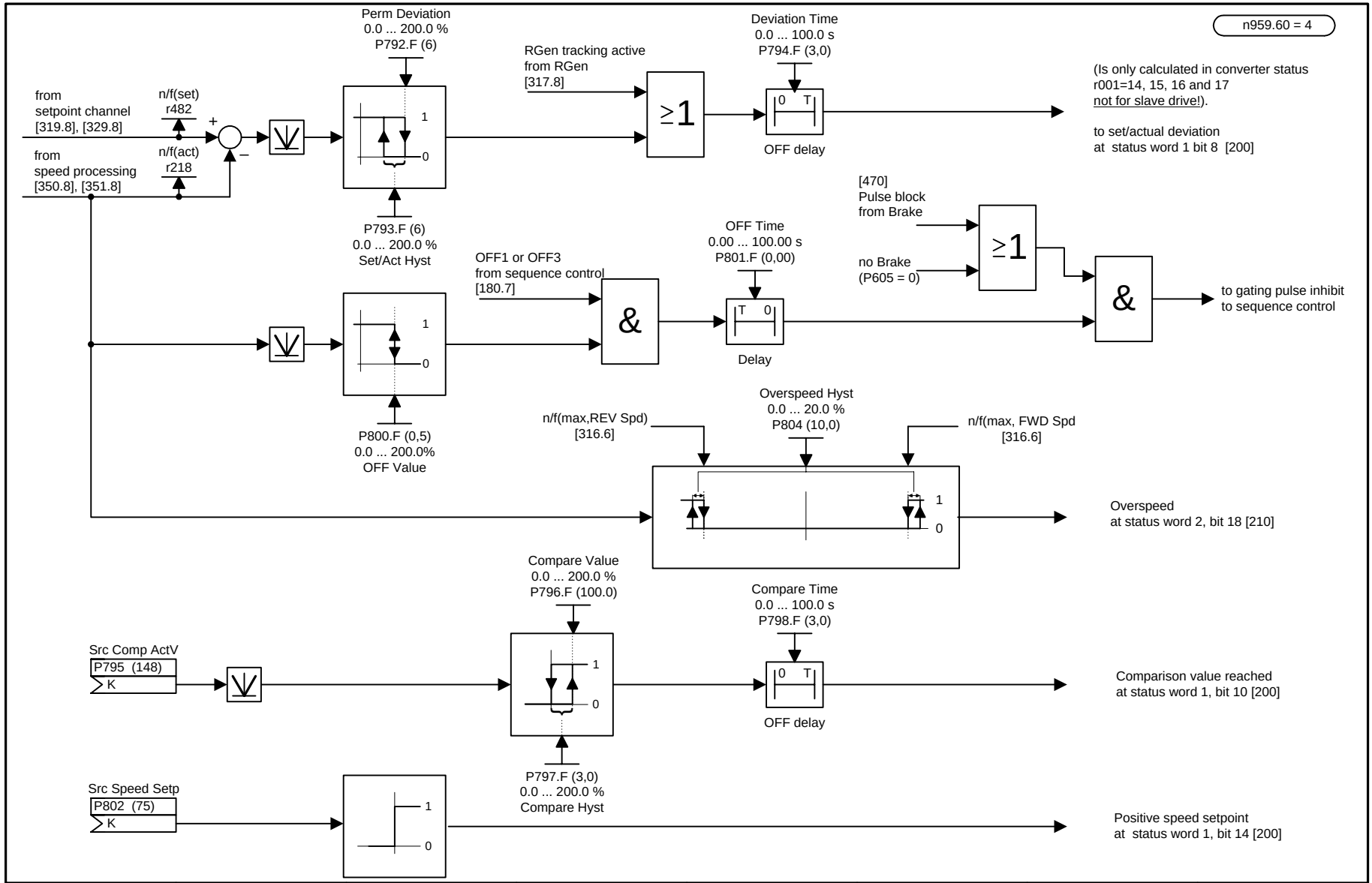
n957.69 = 8



1	2	3	4	5	6	7	8
Temperature model					fp_vc_430_e.vsd	Function diagram	- 430 -
n/f/T control, master/slave drive					31.01.98	MASTERDRIVES VC	

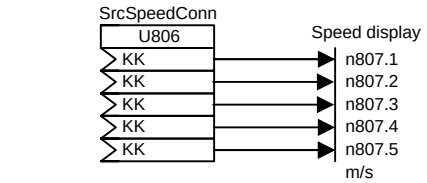


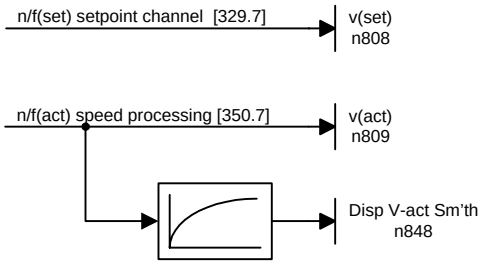
1	2	3	4	5	6	7	8
Braking control					fp_vc_470_e.vsd	Function diagram	- 470 -
					03.07.00	MASTERDRIVES VC	



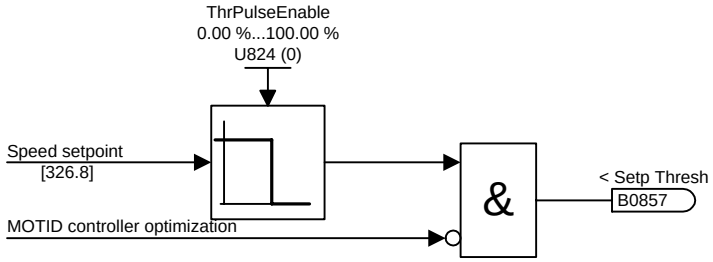
1	2	3	4	5	6	7	8
Messages					fp_vc_480_e.vsd	Function diagram	- 480 -
					07.05.98	MASTERDRIVES VC	

Speed display

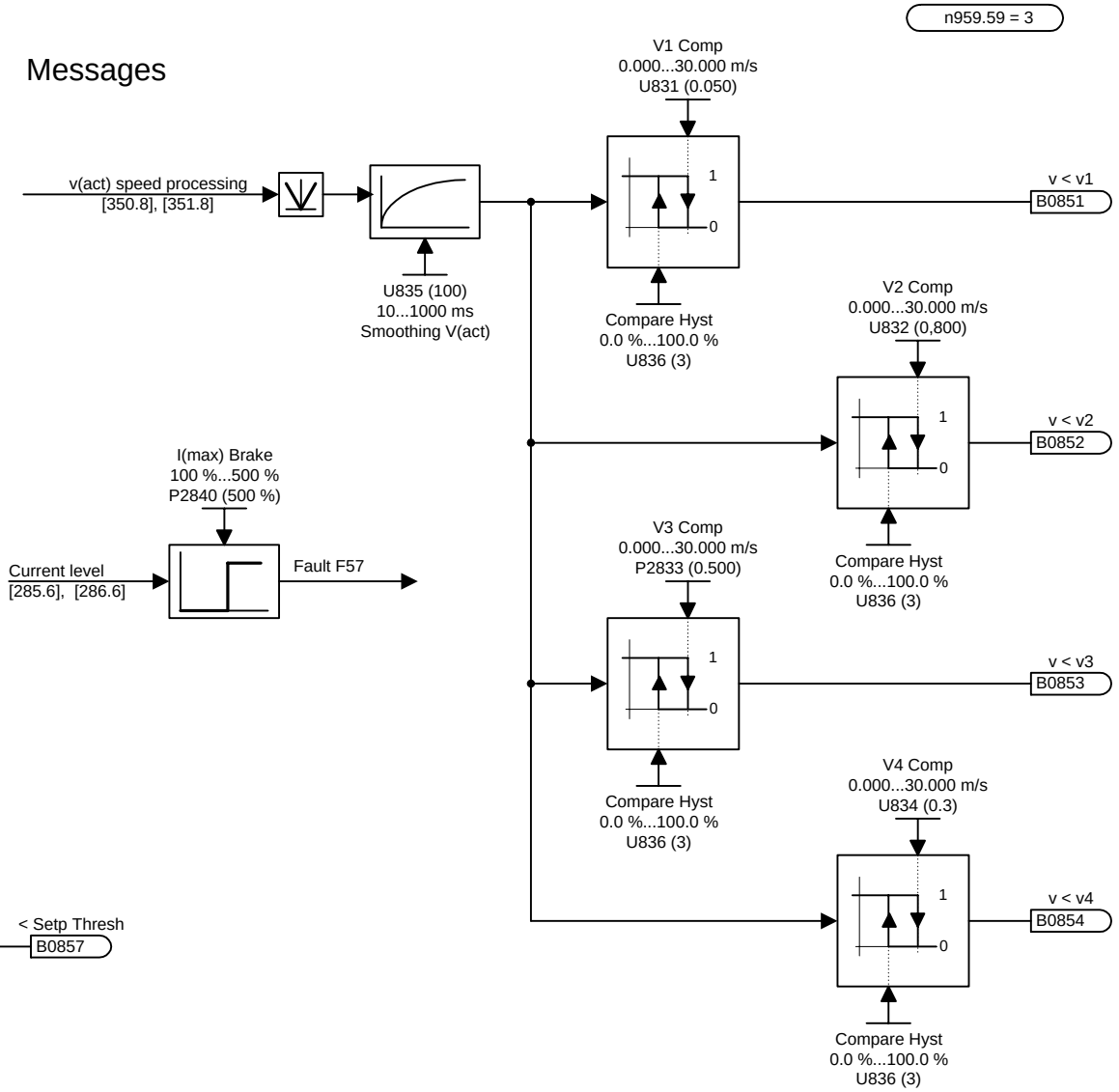




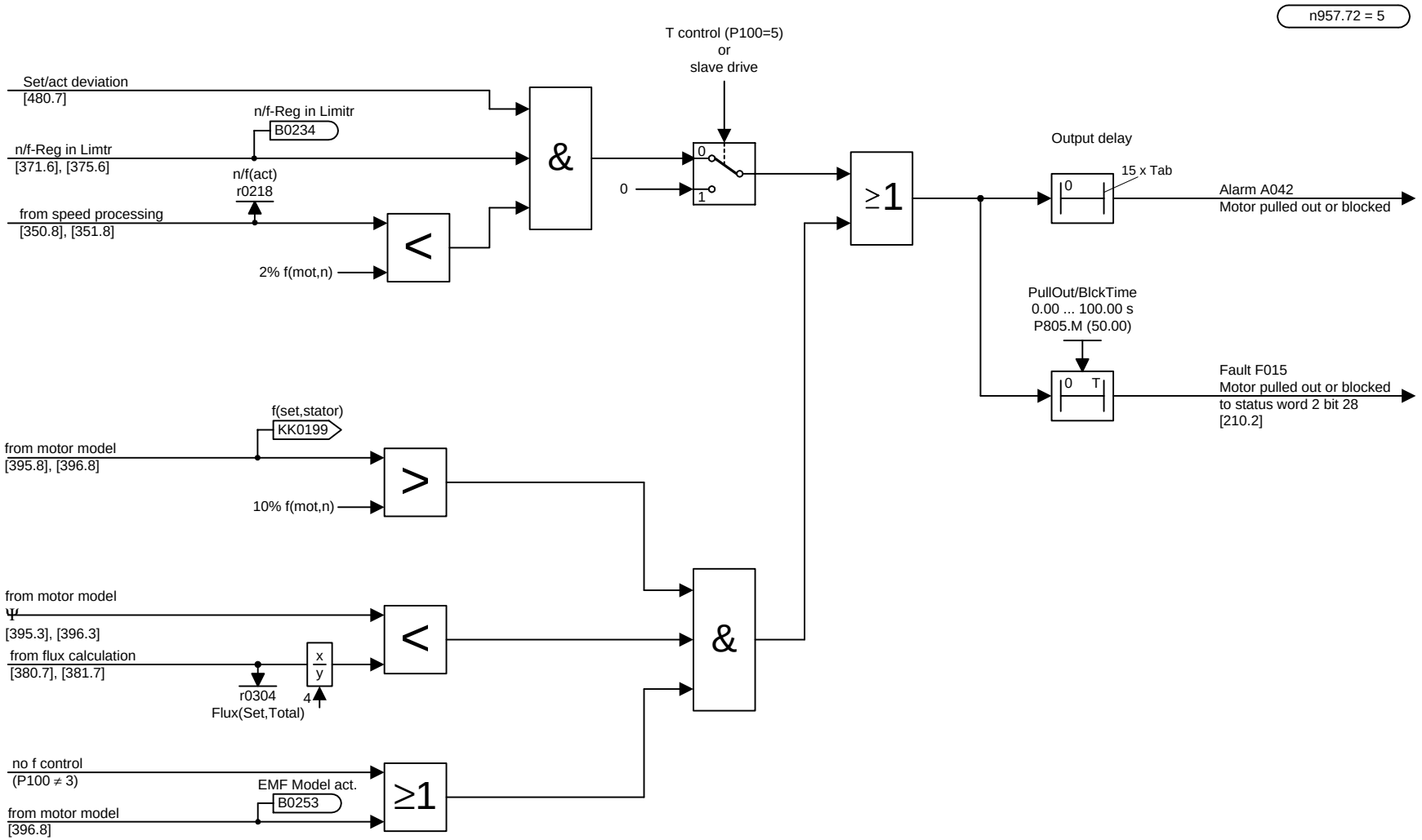
Setpoint < Comparison threshold



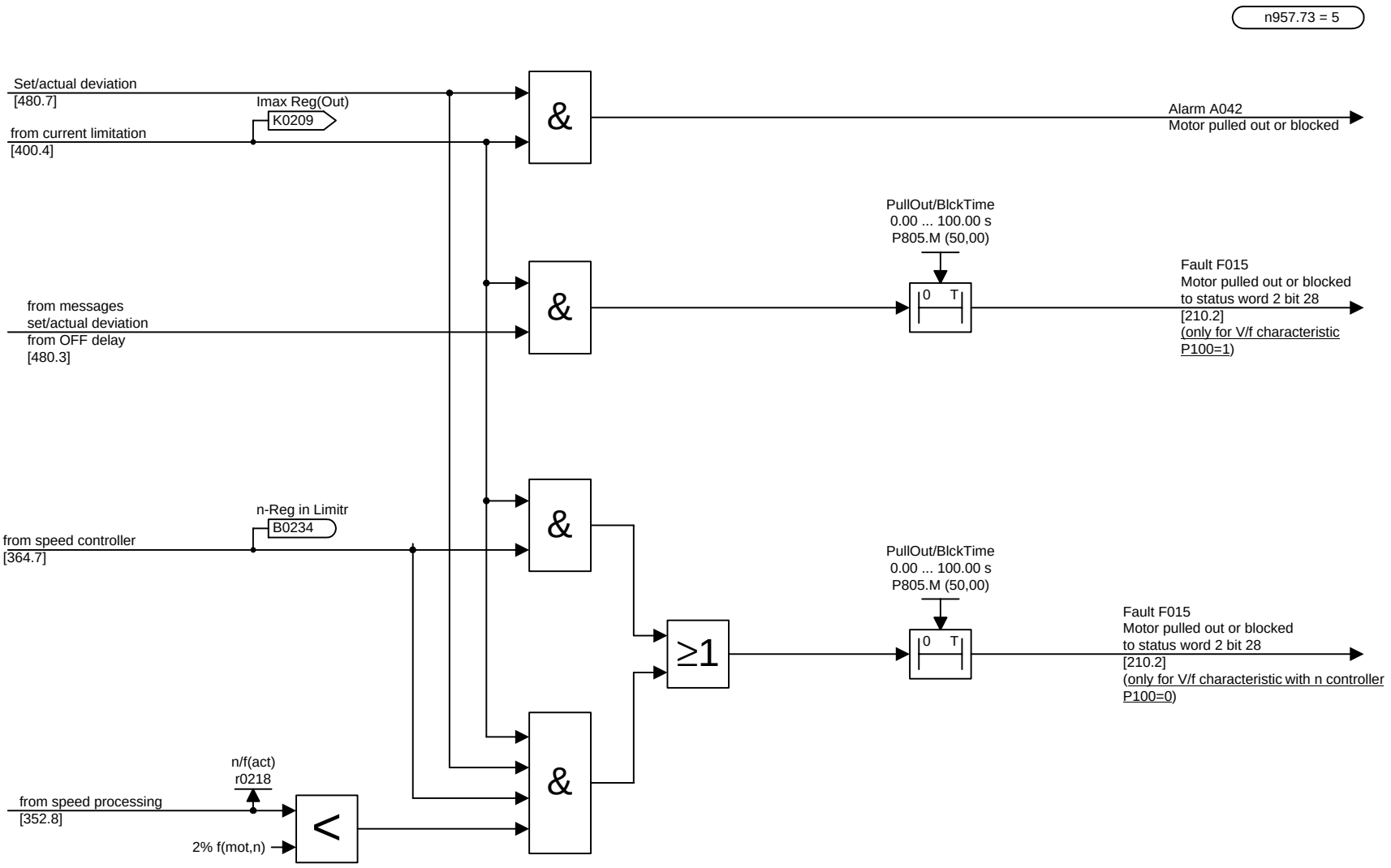
Messages



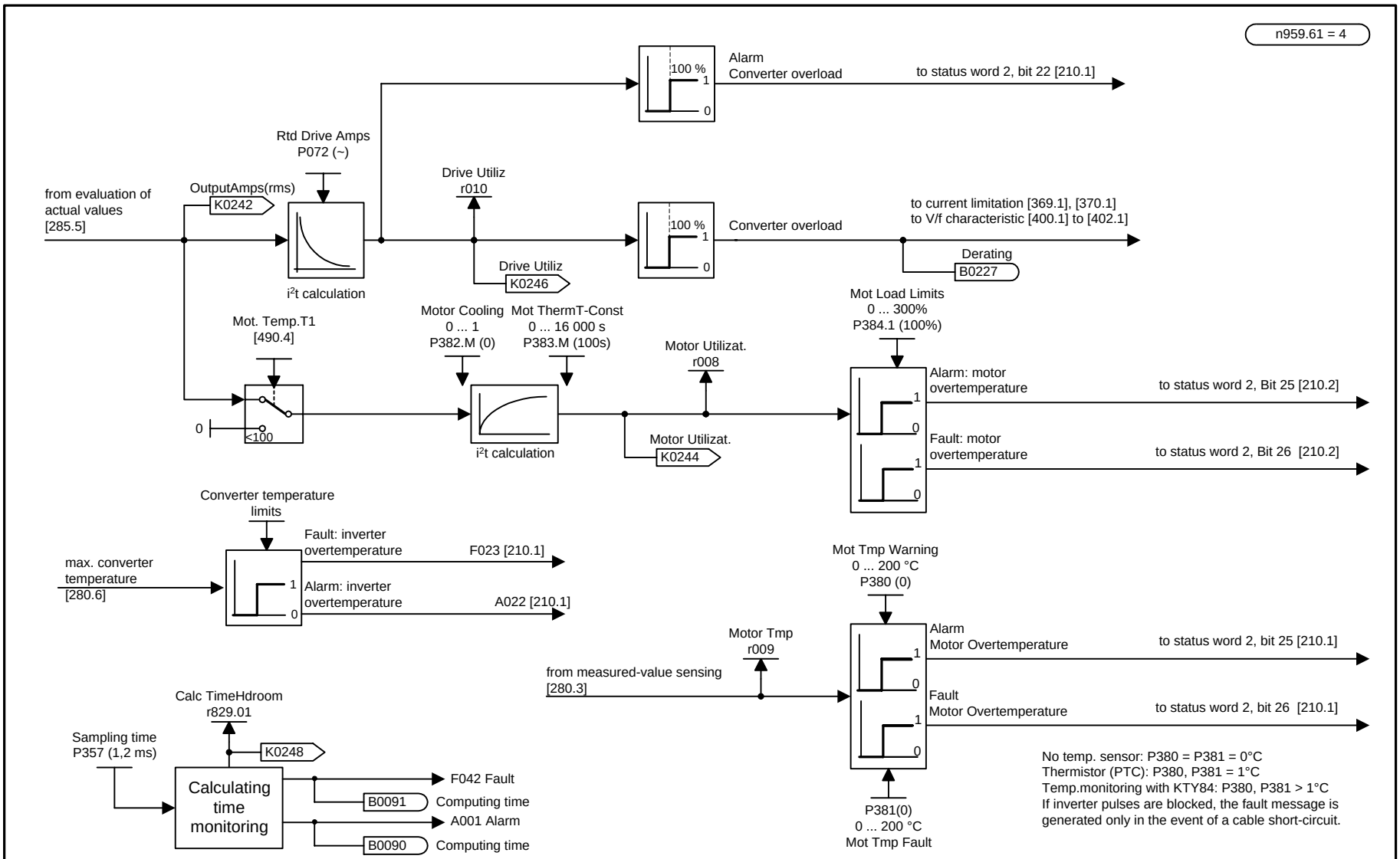
1	2	3	4	5	6	7	8
Messages 2					fp_vc_481_e.vsd	Function diagram	- 481 -
Lift and hoisting-gear applications (P2800=1)					14.10.98	MASTERDRIVES VC	



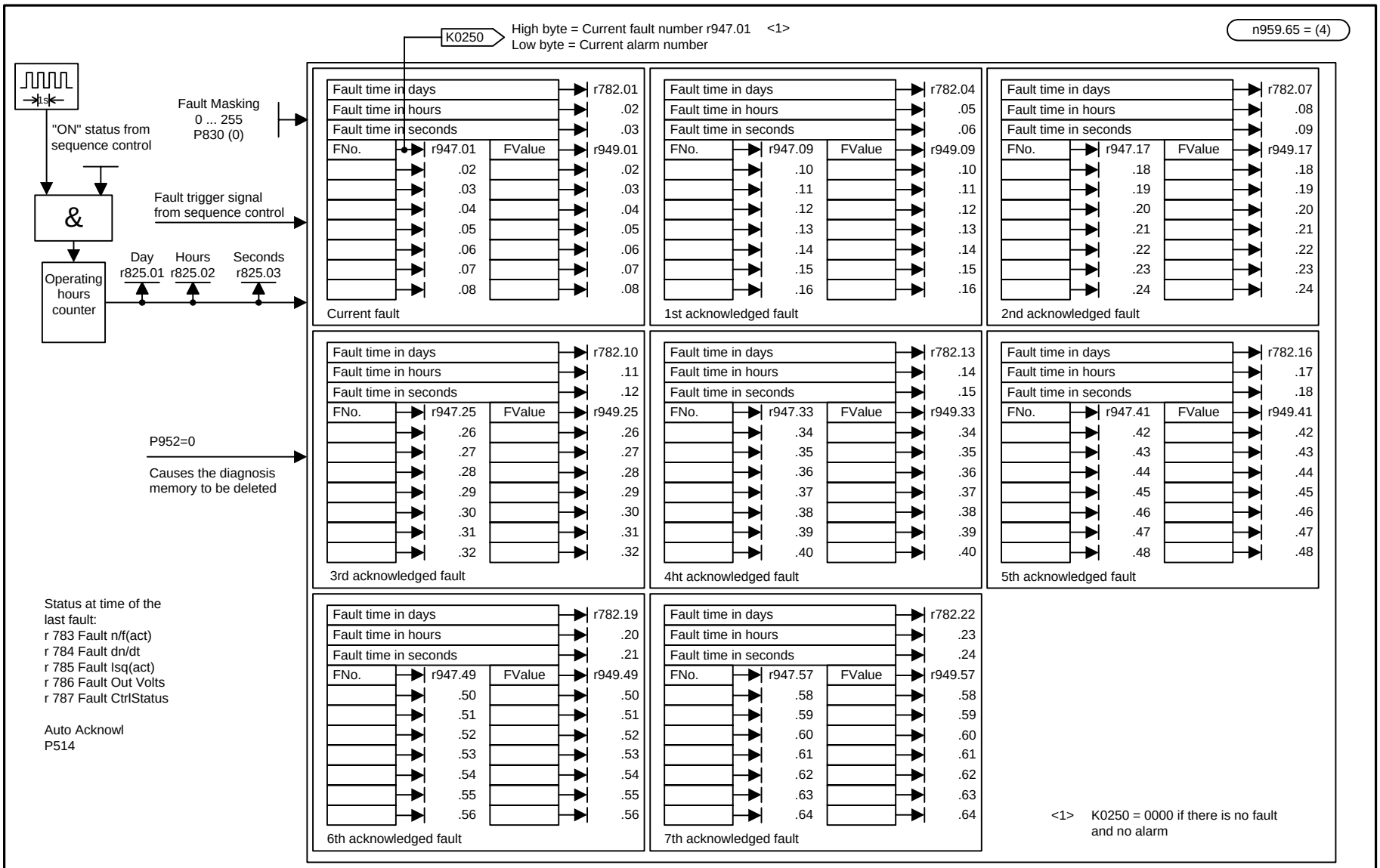
1	2	3	4	5	6	7	8
Blocking/pull-out diagnosis					fp_vc_485_e.vsd	Function diagram	- 485 -
n/f/T control, master/slave drive					31.01.98	MASTERDRIVES VC	



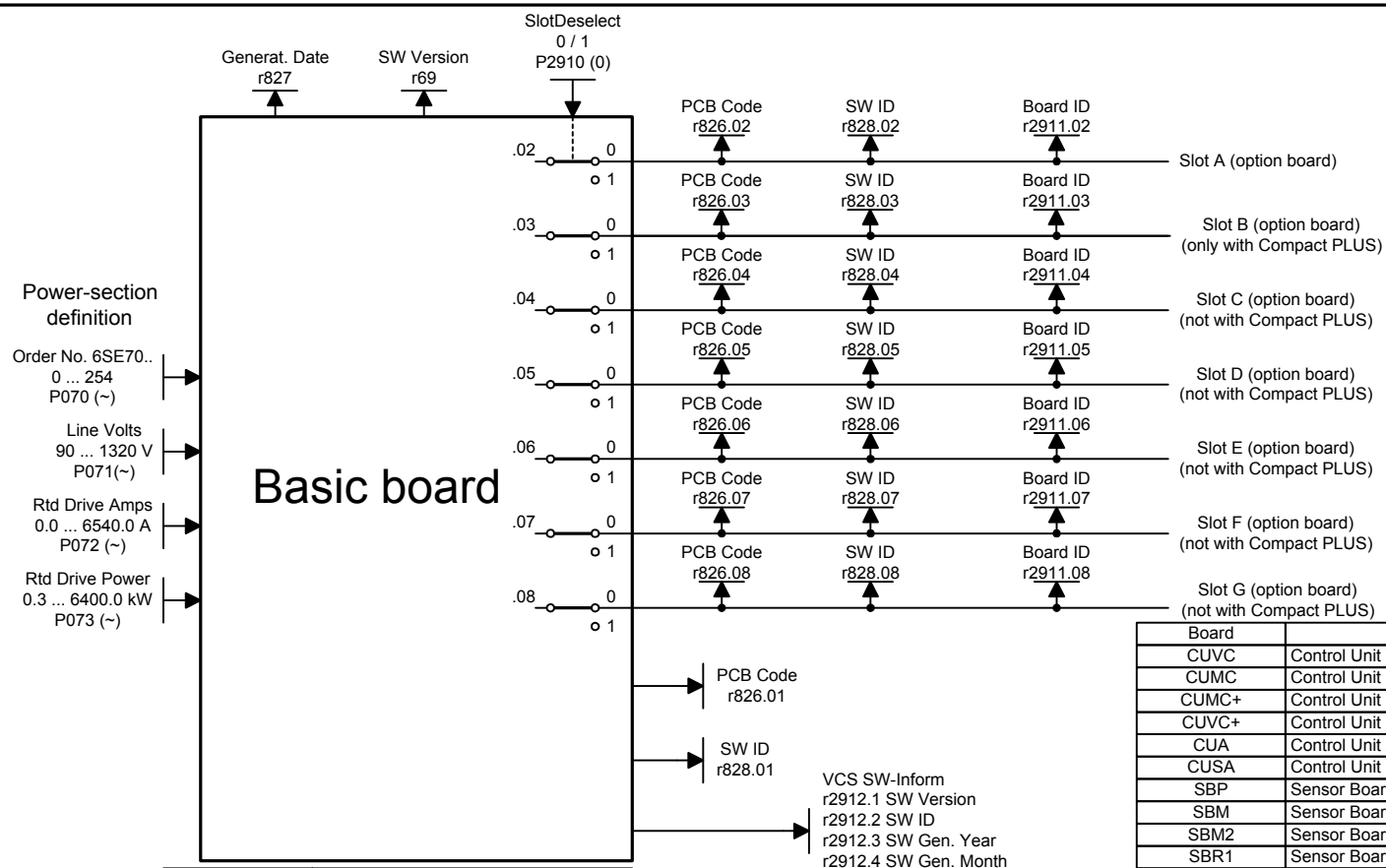
1	2	3	4	5	6	7	8
Blocking diagnosis					fp_vc_486_e.vsd	Function diagram	- 486 -
V/f characteristic and V/f characteristic with speed controller					31.01.98	MASTERDRIVES VC	



1	2	3	4	5	6	7	8
Alarms and faults					fp_vc_490_e.vsd	Function diagram	- 490 -
					31.01.98	MASTERDRIVES VC	

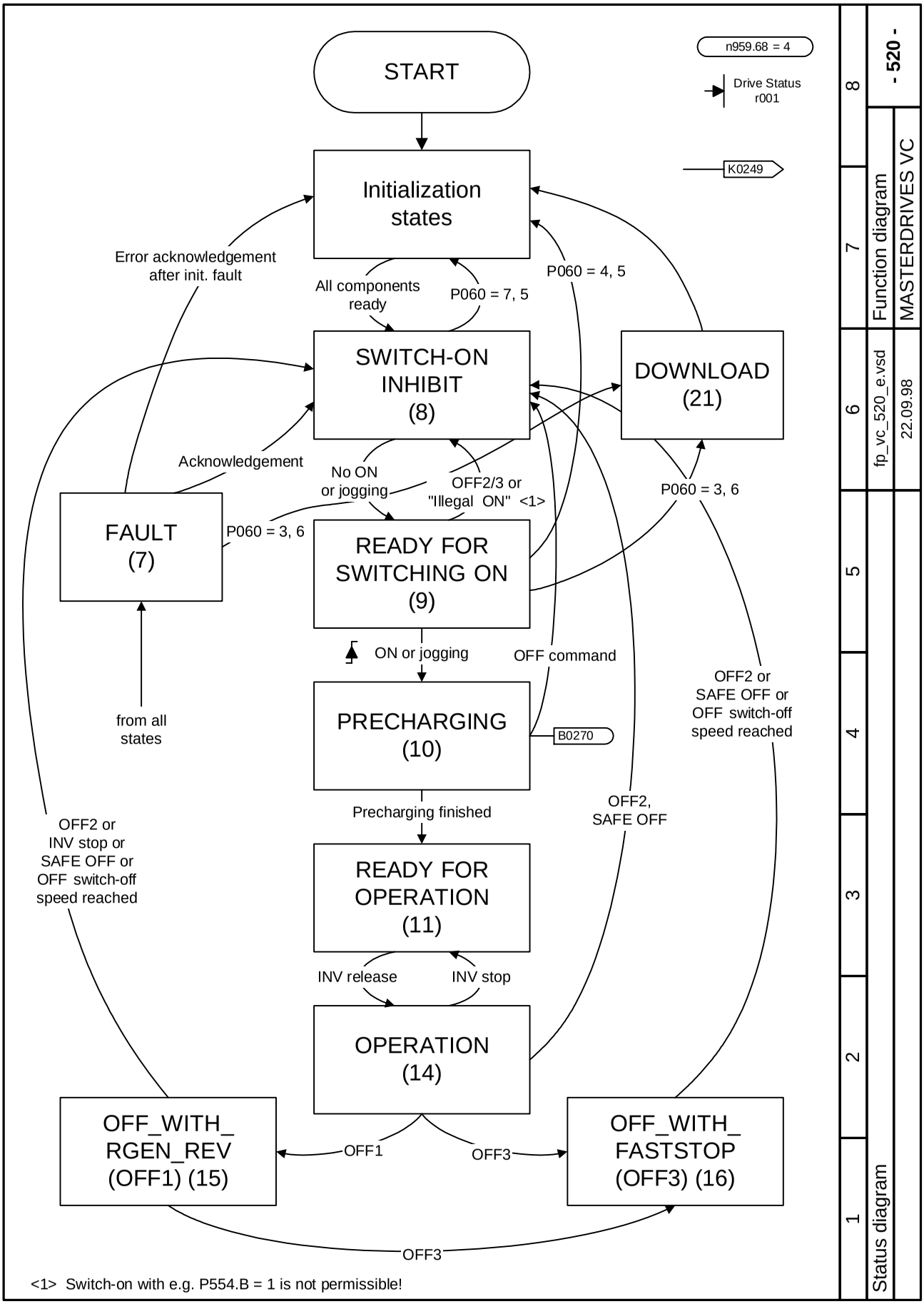


1	2	3	4	5	6	7	8
Fault memory					fp_vc_510_e.vsd	Function diagram	- 510 -
					31.01.98	MASTERDRIVES VC	



r826	Meaning
90 to109	Mainboards or Control Unit
110 to 119	Sensor Board (SBx)
120 to 129	Serial Communication Board (Scx)
130 to 139	Technology Board
140 to 149	Communication Board (Cbx)
150 to 169	Special boards (EBx, SLB)

Board	Meaning	r826
CUVC	Control Unit Vector Control	92
CUMC	Control Unit Motion Control Compact	93
CUMC+	Control Unit Motion Control Compact PLUS	94
CUVC+	Control Unit Vector Control Compact PLUS	95
CUA	Control Unit AFE	106
CUSA	Control Unit Sinus AFE	108
SBP	Sensor Board Pulse	111
SBM	Sensor Board Encoder/Multiturn	112
SBM2	Sensor Board Encoder/Multiturn 2	113
SBR1	Sensor Board Resolver	114
SBR2	Sensor Board Resolver 2	115
SCB1	Serial Communication Board 1 (LWL)	121
SCB2	Serial Communication Board 2	122
T100	Technology Board	131
T300	Technology Board	131
T400	Technology Board	134
CBX	Communication Board	14x
CBP	Communication Board PROFIBUS	143
CBC	Communication Board CANBUS	146
CBP2	Communication Board PROFIBUS 2	148
EB1	Expansion Board 1	151
EB2	Expansion Board 2	152
SLB	SIMOLINK Bus Interface	161


START
n959.68 = 4
Drive Status r001
K0249
Initialization states
Error acknowledgement after init. fault
All components ready
P060 = 7, 5
P060 = 4, 5
SWITCH-ON INHIBIT (8)
DOWNLOAD (21)
Acknowledgement
No ON or jogging
OFF2/3 or "Illegal ON" <1>
P060 = 3, 6
FAULT (7)
P060 = 3, 6
READY FOR SWITCHING ON (9)
ON or jogging
OFF command
from all states
PRECHARGING (10)
B0270
OFF2 or SAFE OFF or OFF switch-off speed reached
Precharging finished
OFF2, SAFE OFF
OFF2 or INV stop or SAFE OFF or OFF switch-off speed reached
READY FOR OPERATION (11)
INV release
INV stop
OPERATION (14)
OFF_WITH_ RGEN_REV (OFF1) (15)
OFF1
OFF3
OFF_WITH_ FASTSTOP (OFF3) (16)
OFF3
<1> Switch-on with e.g. P554.B = 1 is not permissible!
8
7
6
5
4
3
2
1
- 520 -
Function diagram
MASTERDRIVES VC
fp_vc_520_e.vsd
22.09.98
Status diagram

n959.66 = 4

Copy MotDataSet
0 ... 43
P362 (0)

Target data set (1 ... 4)

Source data set (1 ... 4)

MotDataSet bit 18
from control word 2

MotDataSet bit 19
from control word 2

Changeover of motor parameters

Parameter-number	Index 1	Index 2	Index 3	Index 4
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
...				

act. MotDataSet
r011

K0034

Note: The parameters concerned are designated by the code "M".

It is only possible to copy the data sets in the "Ready for ON" mode.

Copy BICO-DS
0 ... 21
P363 (0)

Target data set (1/2)

Source data set (1/2)

BICO data set from
control word 2

Changeover of binector and connector parameters

Parameter-number	Index 1	Index 2
xxxx		
xxxx		
xxxx		
xxxx		
xxxx		
xxxx		
xxxx		
xxxx		
...		

Active BICO DSet
r012

K0035

Note: The parameters concerned are designated by the code "F".

It is only possible to copy the data sets in the "Ready for ON" mode.

Copy FuncDSet
0 ... 43
P364 (0)

Target data set (1 ... 4)

Source data set (1 ... 4)

Function data set bit 16
from control word 2

Function data set bit 17
from control word 2

Changeover of function parameters

Parameter-number	Index 1	Index 2	Index 3	Index 4
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
xxxx				
...				

Active FuncDSet
r013

K0036

Note: The parameters concerned are designated by the code "F".

It is only possible to copy the data sets in the "Ready for ON" mode.

A list of the respective data-set parameters can be found at the end of the complete list of parameter s.

n959.67 = 4

Converter status			Drive setting (P60 = 5) r001 = 5	Ready for ON r001 = 9				
Function:			Automatic parameterization [8]	Automatic parameterization [8]	Measurement at standstill [6] [8] [9]	No-load measurement [6]	n/f-controller optim. P536 [6]	Ground fault test P375 [6] [8] [9]
Selection			P115 = 1 (2, 3)	P115 = 1 (2, 3)	P115 = 2 (3, 6)	P115 = 4 (3)	P115 = 5 (3)	auch bei P115 = 2 (3, 6)
Motor rating-plate data (P60 = 5)					Start with switch-on command (compare P554): Current measuring section r377			
P95 = 2 [1]	P95 = 10(IEC) [1]	P95 = 11 [1]	Reference values:					r376 = GrdFltTestResult
P97 = Selection of 1PH7 (= 1PA6) 1PL6 1PH4	P100 = Reg.Art	P100					P537 = n/f-RegDyn(act)	
	P101 = $U_{mot,n}$	P101	P351 = V_{ref} = P101				P538 = n/f Reg Osq Freq	
	P102 = $I_{mot,n}$	P102	P350 = I_{ref} = P102		r539 = TestPulseResult			r539 = TestPulsesResult
	P103 = I_0 [2]	P103 [2]				r540 = TachTestResult [7]	r540 = TachTestResult [7]	
	P104 = cosφ$_n$	——			r541=Mot ID R(Stator)→ P121			
	—— = $P_{mot,n}$	P105			r542=Mot ID R(Rotor)→ r126, → P127			
	—— = η	P106						
	P107 = $f_{mot,n}$	P107	P352 = f_{ref} = P107		r543=Mot ID VoltsDrop→ P347			
	P108 = $n_{mot,n}$	P108	P353 = n_{ref} = P107 * 60 / P109					
	P109 = zp [3]	P109 [3]			r545=Mot ID DeadTime→ P349			
	P113 = $M_{mot,n}$ [4]	P113 [4]	P354 = M_{ref} = P113		r546=MotID X(leakage)→ P122			
P114 [5]	P114 =Technol. Cond [5]	P114 [5]			P103 = Mot Magn Amps	P103 = Mot Magn Amps		
			r110 = Motor Rtd Slip	r110	r110	r110	r110	
							P116 = Start-up Time	
			P117 = Resist Cable	P117	P117	P117	P117	
			r118 = Resist Stator ++	r118	r118	r118	r118	
			r119 = Magn. Current	r119	r119	r119	r119	
			P120 = Main reactance	P120	P120	P120		
			P121 = Stator Resist	P121	P121			
			P122 = Tot Leak React	P122	P122			
			r124 = Rotor Time Const	r124	r124			
			r125 = T(sigma)	r125	r125			
			r126 = RotResist	r126	r126			
			P127 = RotResistTmpFact = 80%	P127 = 80%	P127 = 80%		P127 = 80%	
			P347 = ON VoltsCompens.	P347	P347			
			P348 = Dead Time Comp. = 0	P348 = 0	P348 = 0			
			P349 = T(DeadTimeComp.)	P349	P349			
			P471 = Scale Torq(PRE) =0%	P471 = 0%			P471 = 100%	

[1] For synchronous motors and V/f characteristic, select P95 = 10,11.

[2] With P103 = 0.0%, the magnetizing current is calculated (compare r119).

[3] Is re-calculated if P107 or P108 is altered (not in the case of download).

[4] All torque signals and displays relate to P354/ P113.

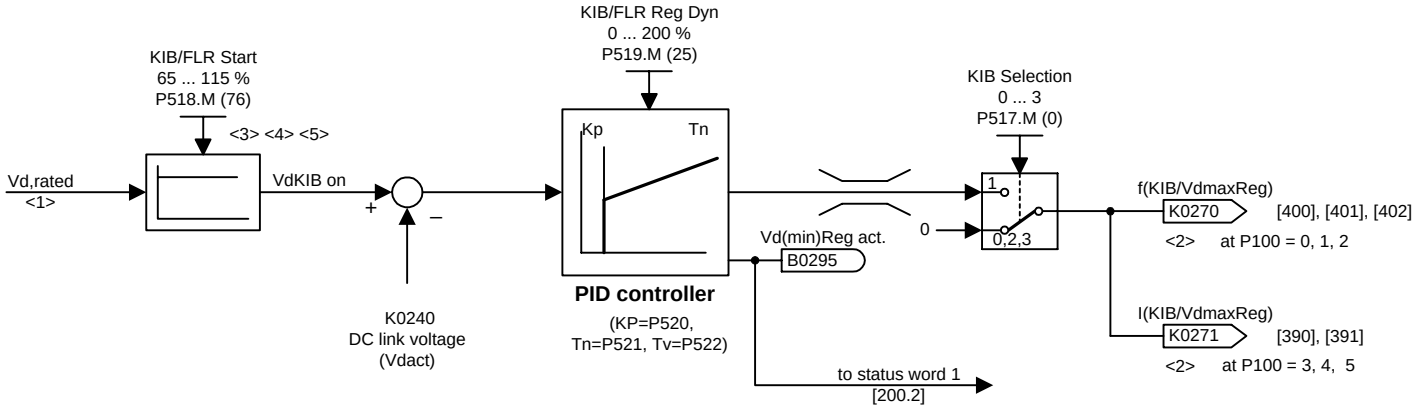
[5] With P114 = 0, a standard setting is made.

[6] With P115 = 3, motor identification is carried out completely. To do this, the converter/inverter must be switched on twice

[7] The tachometer test can also be selected with P115 = 7.

[8] Automatic parameterization is also carried out if measurement at a standstill is selected.

[9] With P115 = 6, the parameters determined are not adopted.



<1> Vd,rated = 1.315 x P071 (AC unit)
= P071 (DC unit

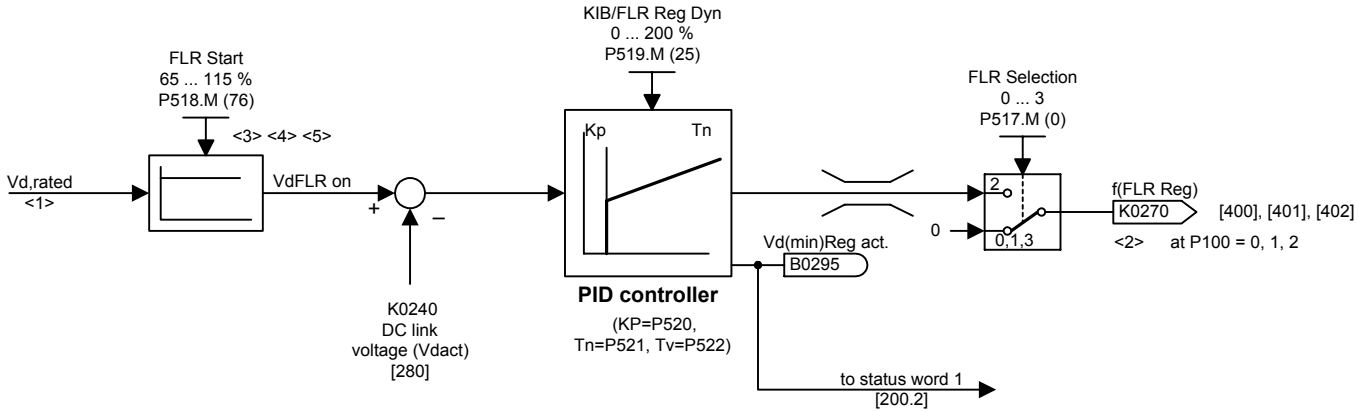
<2> K0270, K0271 are also used for the functions Vdmax control [610] and flexible response [605]!

<3> The KIB switch-off threshold VdKIB Off is 5% above the VdKIB On starting point.

<4> The fault message F008 "DC link undervoltage" comes at Vd<61% Vd,rated with released KIB.

<5> For P518 values >90% are only practical, if an Active Front End (AFE) is used as rectifier/regenerative unit.

n957.76 = 0



<1> Vd,rated = 1.315 x P071 (AC unit)
= P071 (DC unit)

<2> K0270 is also used for the functions kinetic buffering [600] and Vdmax control [610] .

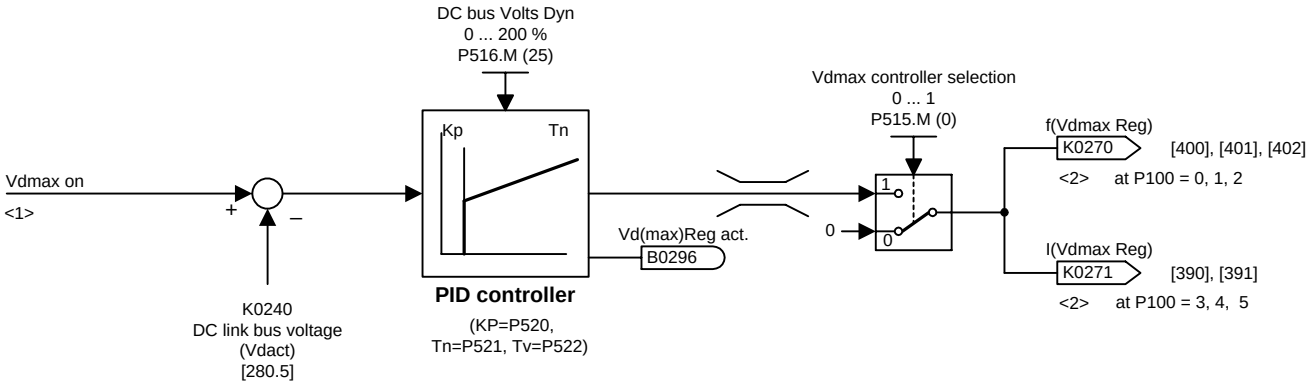
<3> The FLR switch-off threshold VdFLR off is 5% above the starting point of VdFLR on.

<4> The threshold for F008 "DC link undervoltage" can be reduced via P523 FLR Vdmin. It should be at least 10% below the FLR starting point.

FLN Ud(min)
50 ... 76%
P523.M (76%)

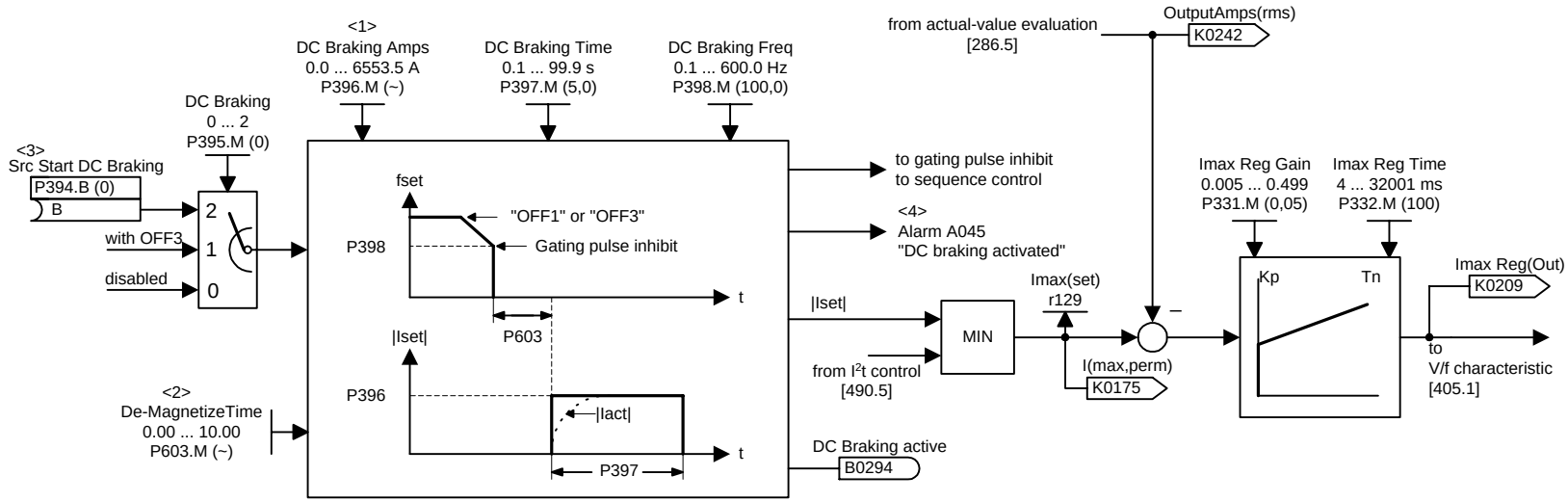
<5> For P518 values >90% are only practical if an Active Front End (AFE) is used as a rectifier/ regenerative unit.

n957.77 = 0



<1> Vdmax on = 119% x P071 x 1.315 (AC unit)
= 1.19 x P071 (DC unit)

<2> K0270 and K0271 are also used for the functions kinetic buffering [600] and flexible response [610].



<1> The DC braking current is calculated during automatic parameterization (P115=1, 2, 3). It can be set at a maximum of 4 times the rated motor current.

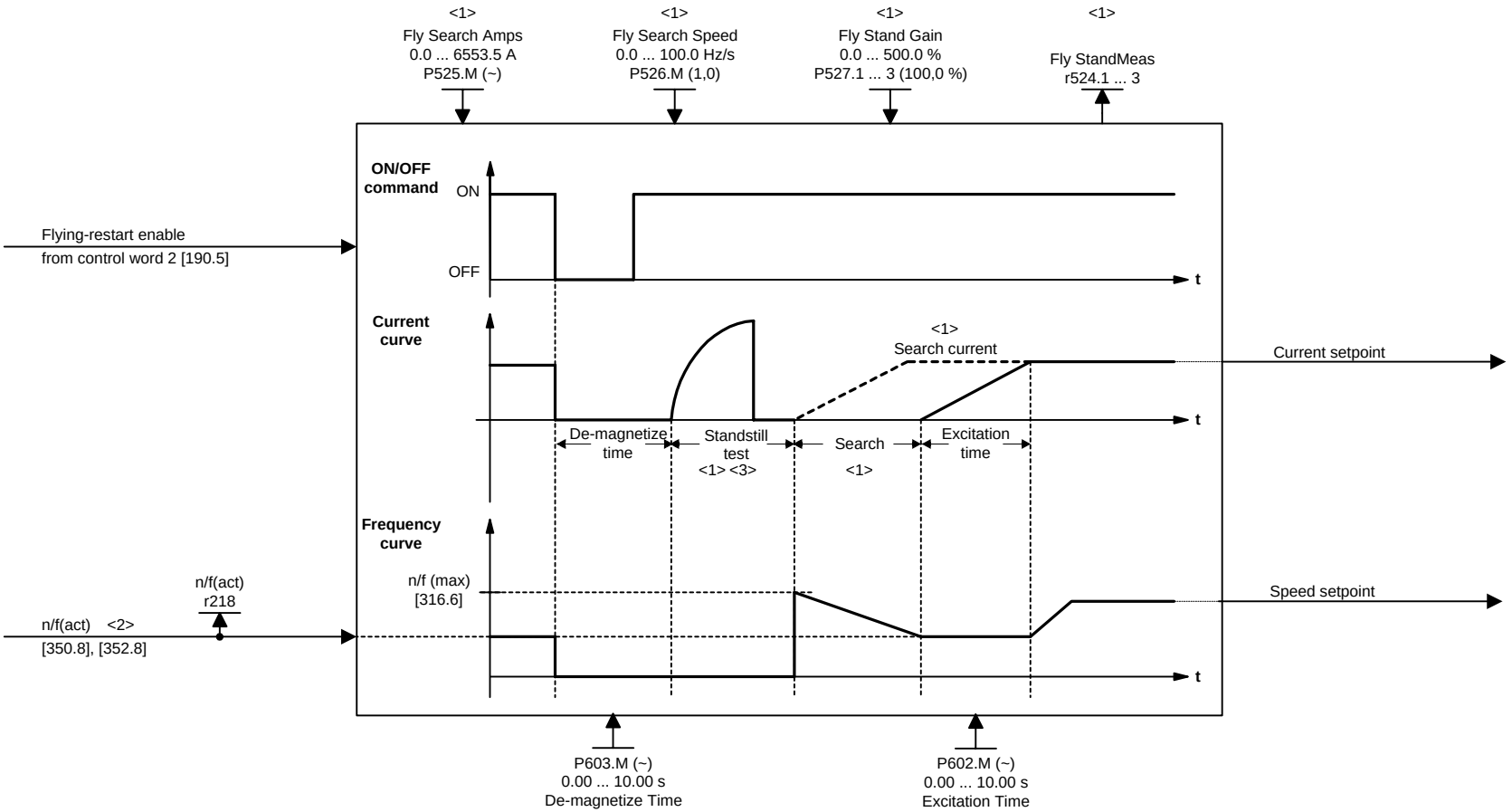
<2> The de-excitation time is calculated during automatic parameterization (P115=1, 2, 3).

<3> The "DC braking" function can be started via binector selection only from drive statuses (r001) "Operation", "OFF1" and "OFF3".

If the "DC braking" function is deselected again during DC braking time (P397) via binector selection, the "Flying restart" function is automatically activated!

<4> The alarm A045 appears if "DC braking" has been activated and the motor frequency is higher than the frequency at which DC braking starts.

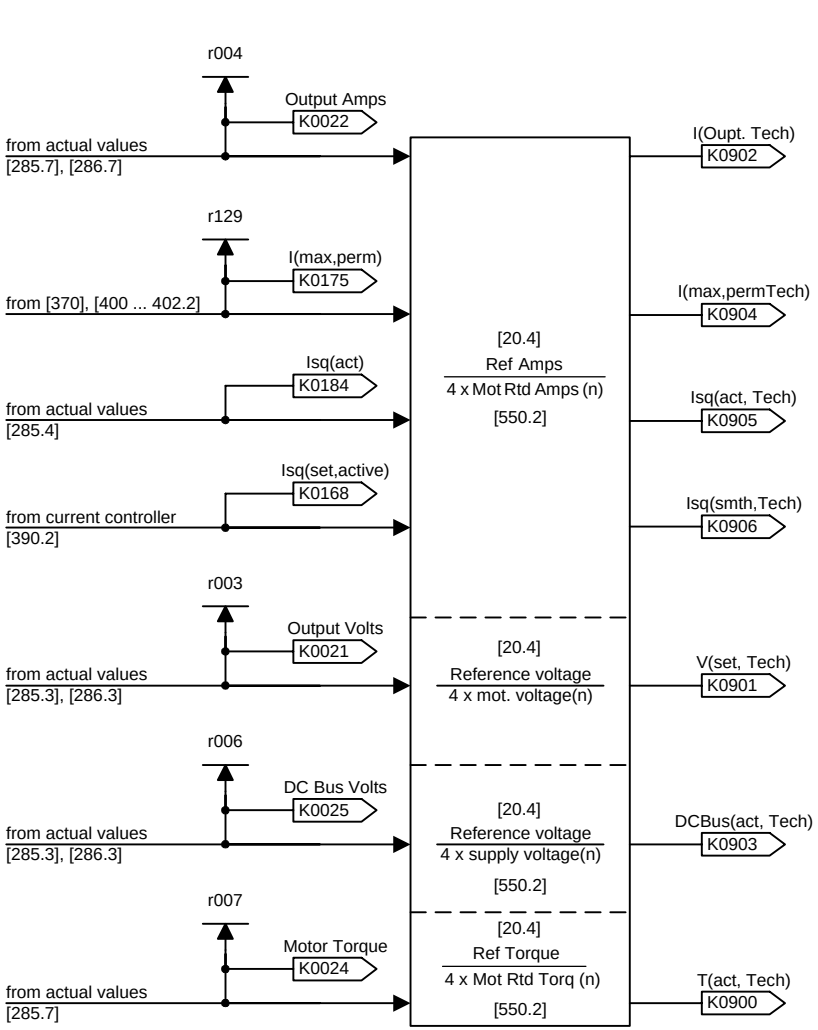
n957.79 = 4



<1> Only in the case of flying restart without encoder signal (search).

<2> Only in the case of flying restart with encoder signal (indepent of control mode).

<3> No standstill test when P527.1 = 0,0 %.


n959.98 = 3
r004
Output Amps
K0022
from actual values
[285.7], [286.7]
r129
I(max,perm)
K0175
from [370], [400 ... 402.2]
Isq(act)
K0184
from actual values
[285.4]
Isq(set,active)
K0168
from current controller
[390.2]
r003
Output Volts
K0021
from actual values
[285.3], [286.3]
r006
DC Bus Volts
K0025
from actual values
[285.3], [286.3]
r007
Motor Torque
K0024
from actual values
[285.7]
[20.4]
Ref Amps
4 x Mot Rtd Amps (n)
[550.2]
[20.4]
Reference voltage
4 x mot. voltage(n)
[20.4]
Reference voltage
4 x supply voltage(n)
[550.2]
[20.4]
Ref Torque
4 x Mot Rtd Torq (n)
[550.2]
I(Oupt. Tech)
K0902
I(max,permTech)
K0904
Isq(act, Tech)
K0905
Isq(smth,Tech)
K0906
V(set, Tech)
K0901
DCBus(act, Tech)
K0903
T(act, Tech)
K0900