Function plans

On the following pages, you can find proven fundamental function plans for control tasks in transfer systems.

Contrary to DIN IEC 61131-3, qualifiers are used in the action blocks, which are explained in the table below.

Action block	Explanation
S	Storing
NS	Non-storing
S	Set
R	Reset
NS T3 D ? T3 S Y2.1 S	Non-storing triggering of a time function (with cycle time T). After it has been concluded, a switch function is triggered.

Simple VE 5 stop gates are used to stop workpiece pallets. The position of the workpiece pallets is queried with separate sensors.

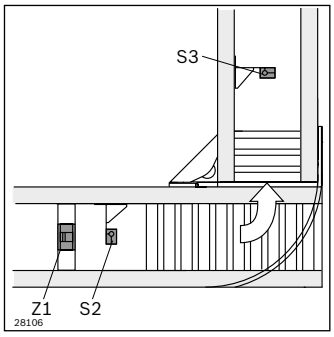
The function plans are simplified accordingly if using stop gates with integrated sensors and internal switching logic.

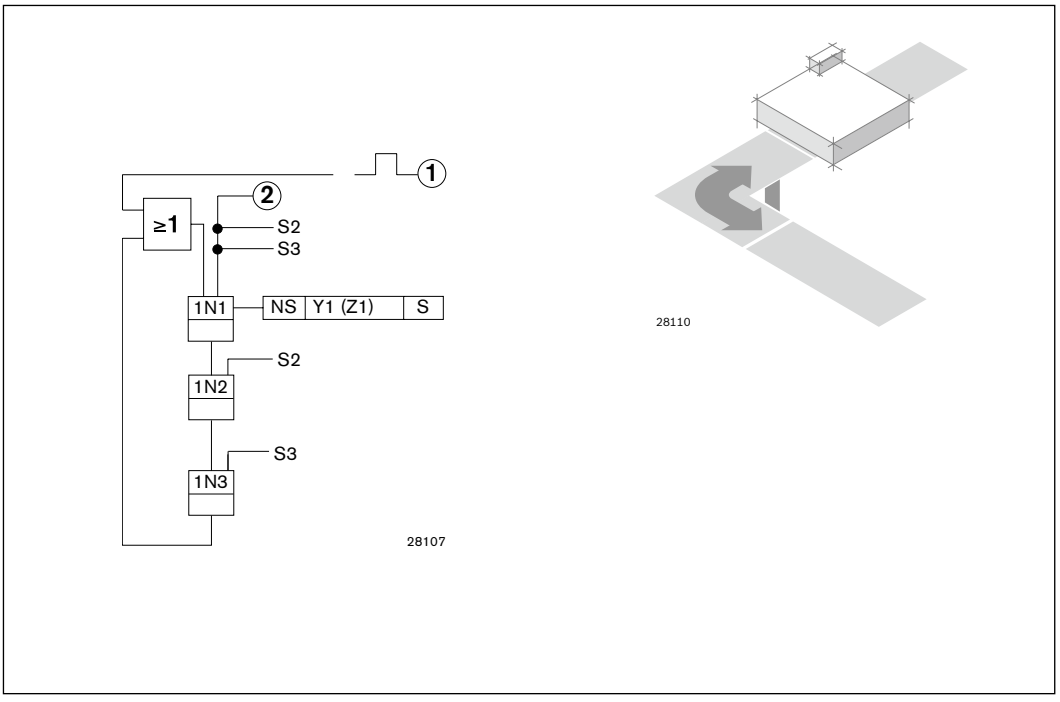
General abbreviations

WT	=	Workpiece pallet
VE	=	Stop gate
S...	=	Signaling device
Y...	=	Valve
Z...	=	Cylinder
LT	=	Longitudinal conveyor (main section)
QT	=	Transverse conveyor (adjacent section)
HQ	=	Lift transverse unit
DA	=	Damper
①	=	Start pulse after end of start-up
②	=	Release cyclic travel

Function plans

Curve CU

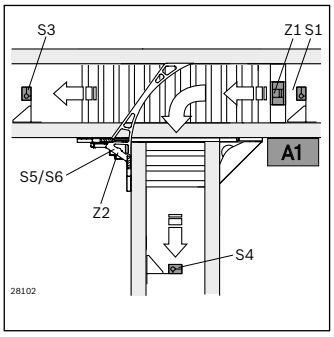


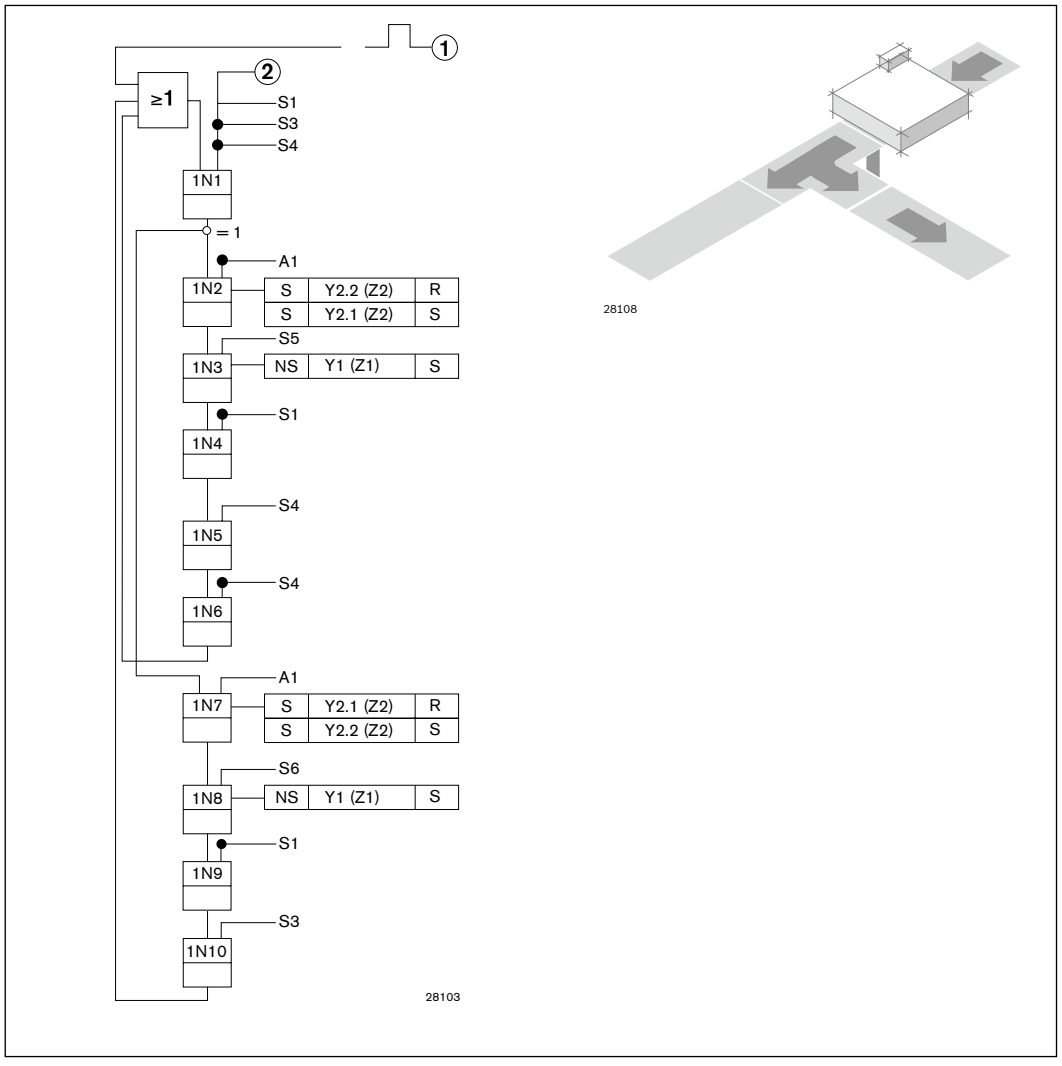


S2 = WT after VE
S3 = WT after CU
Y1 = Open VE (Z1)

Function plans

DI diverter

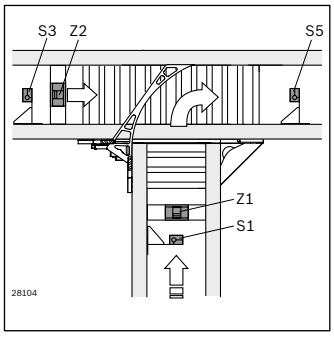


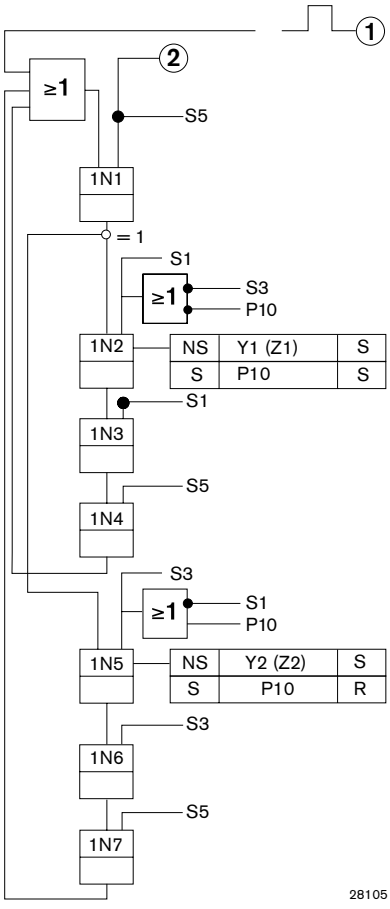


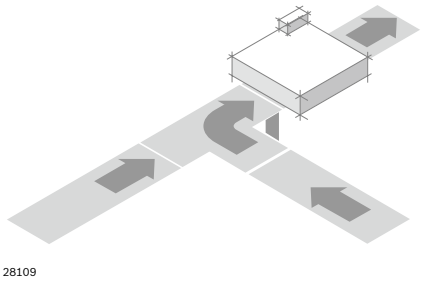
S1 = WT at VE (Z1)
S3 = WT behind main section diverter
S4 = WT behind secondary section diverter
S5 = Diverter open
S6 = Diverter closed
Y2 = Diverter (Z2)
Y1 = Stop gate (Z1)
A1 = Identification system with straight-ahead signal

Function plans

JU junction



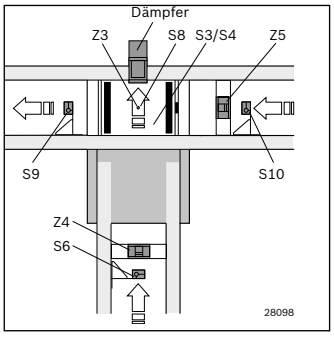


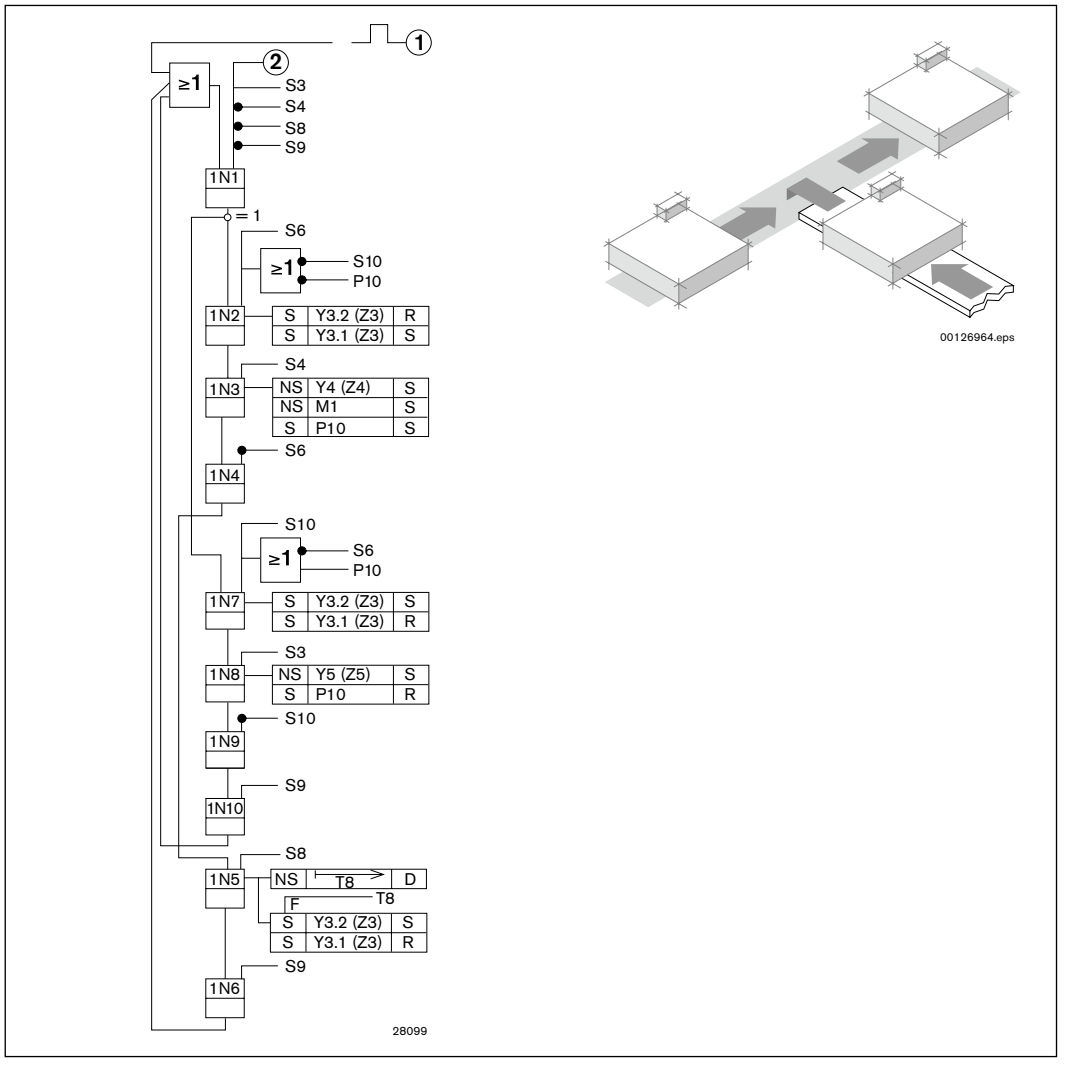


S1 = WT at VE (Z1)
S3 = WT at VE (Z2)
Y1 = Adjacent section VE (Z1)
Y2 = VE main section (Z2)
P10 = Priority main section

Function plans

HQ lift transverse unit (stop gate, infeeding)

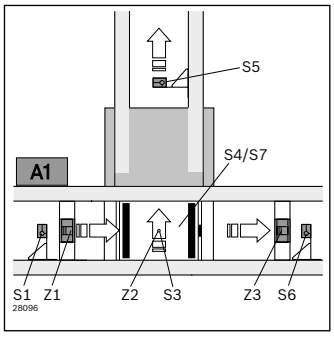


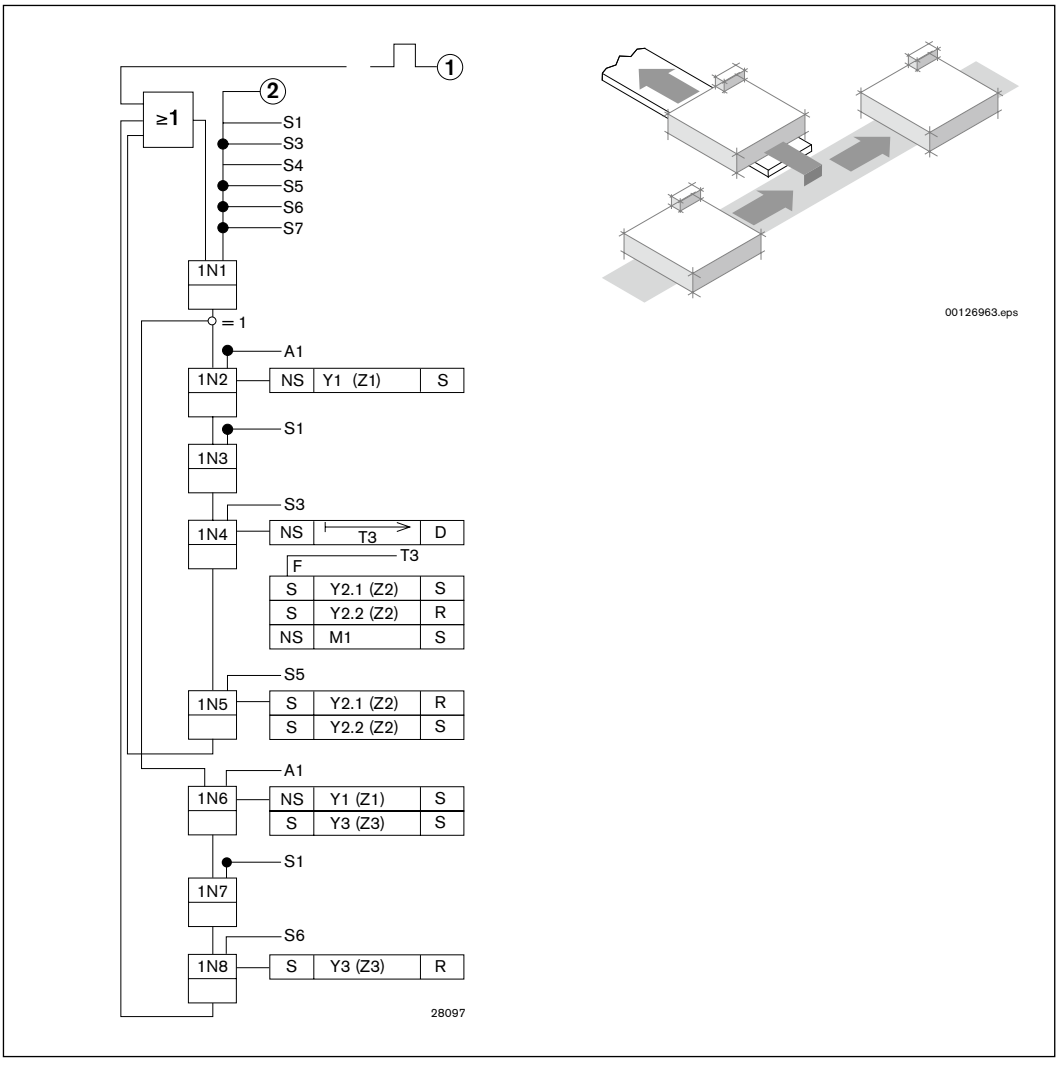


T8	=	Delaying time 100...200 ms
S3	=	Lift end position at bottom
S4	=	Lift end position at top
S6	=	WT before VE (Z4)
S8	=	WT on HQ
S9	=	Enable main section 2
S10	=	WT in front of stop gate (Z5)
Y3	=	HQ lift cylinder (Z3)
Y4	=	VE secondary section (Z4) + DA main section (Z6)
Y5	=	VE main section (Z5)
M1	=	HQ motor
P10	=	Priority main section

Function plans

HQ lift transverse unit (separating, outfeeding)

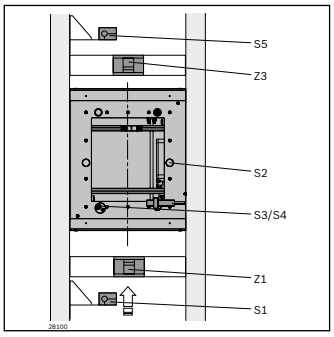


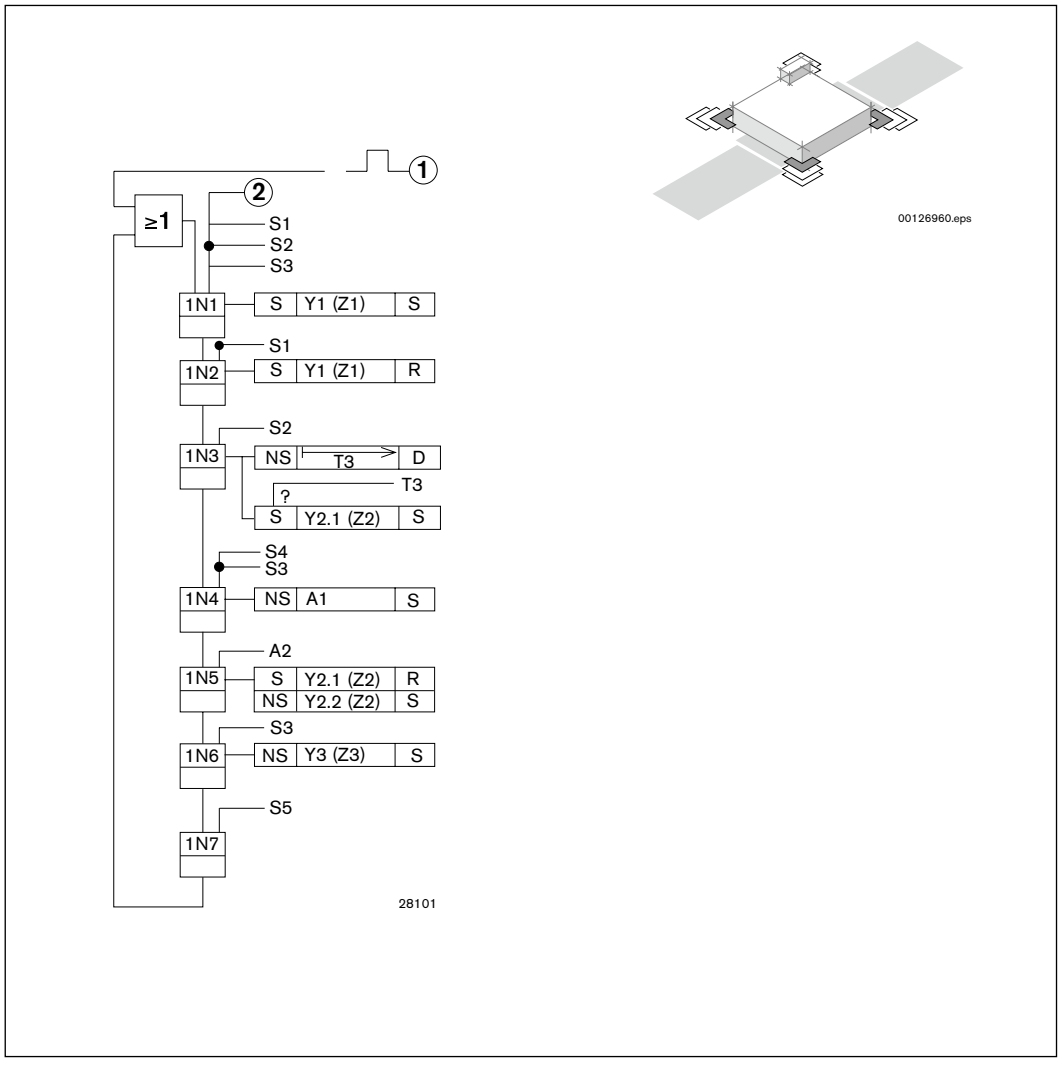


T8	=	Delaying time 100...200 ms	Y2	=	HQ lift cylinder (Z2)
S4	=	Lift end position at bottom	Y1	=	Main section VE (Z1)
S7	=	Lift end position at top	Y3	=	VE main section (Z3)
S1	=	WT before VE (Z1)	M1	=	HQ motor
S3	=	WT on HQ	A1	=	Identification system with straight ahead signal
S5	=	Enable main section			
S6	=	WT after stop gate (Z3)			

Function plans

PE positioning unit

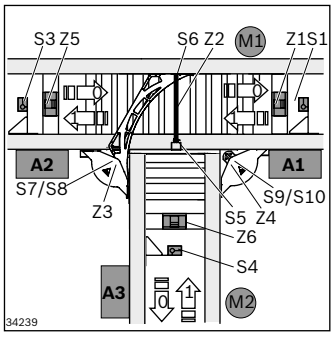


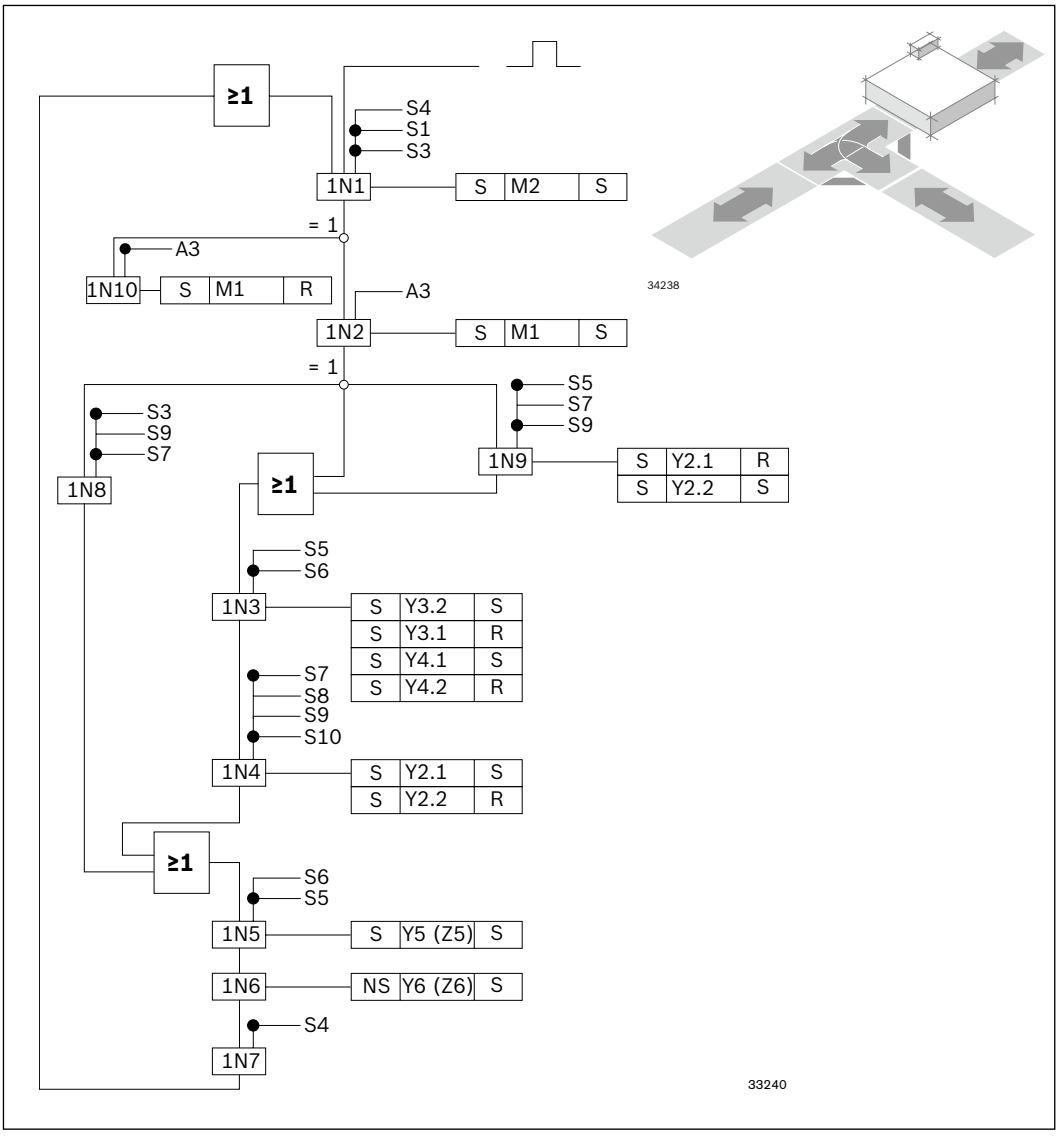


S1	=	WT before VE
S2	=	WT arrival
S3	=	End position of lift bottom
S4	=	End position of lift top
S5	=	WT after VE
Y1	=	Open VE (Z1)
Y2	=	WT lift (Z2)
Y3	=	Open VE (Z3)
A1	=	Start of processing
A2	=	End of processing

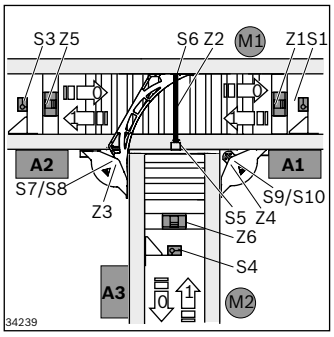
Function plans

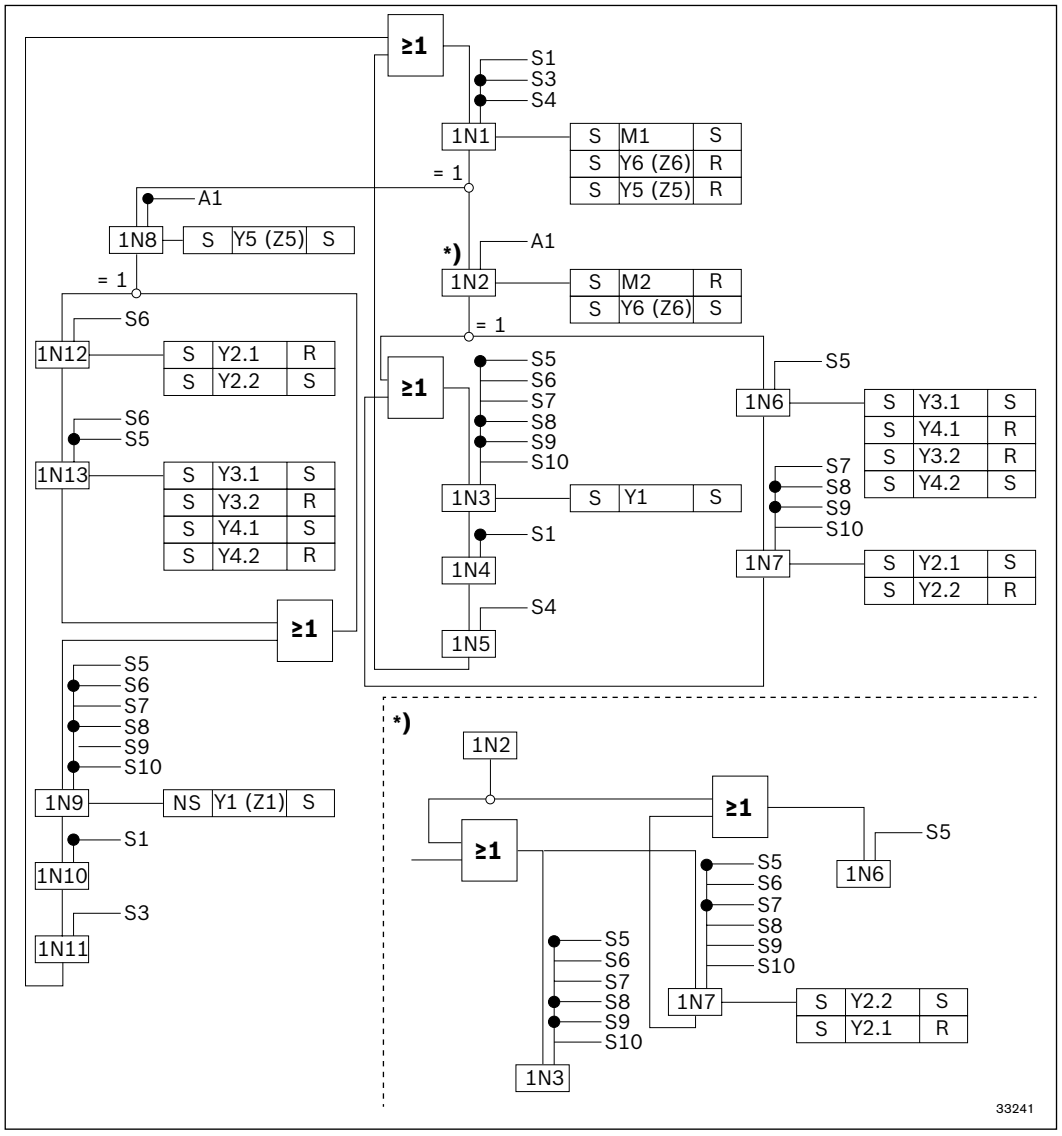
Three-way diverter





S5	=	Diverter closed	A3	=	0 = right	Y4.2	=	Bottom
S6	=	Diverter open			1 = left	M1	=	0 = right
S7	=	Top	Y1, Y5, Y6	=	Stop gate (Z1, Z5, Z6)			1 = left
S8	=	Bottom	Y2.1	=	Open	M2	=	0 = bottom
S9	=	Top	Y2.2	=	Closed			1 = top
S10	=	Bottom	Y3.1	=	Top			
A1/A2	=	0 = branch	Y3.2	=	Bottom			
		1 = straight on	Y4.1	=	Top			





* Optional kit

S5	=	Diverter closed	A3	=	0 = right	Y4.2	=	Bottom
S6	=	Diverter open			1 = left	M1	=	0 = right
S7	=	Top	Y1, Y5, Y6	=	Stop gate (Z1, Z5, Z6)			1 = left
S8	=	Bottom	Y2.1	=	Open	M2	=	0 = bottom
S9	=	Top	Y2.2	=	Closed			1 = top
S10	=	Bottom	Y3.1	=	Top			
A1/A2	=	0 = branch	Y3.2	=	Bottom			
		1 = straight on	Y4.1	=	Top			