STATUS OF THE NICA-MPD-PLATFORM

Author:

Krystian Rosłon

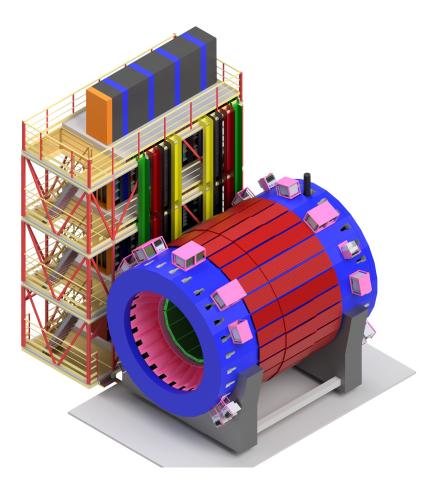
Sector No 3; Engineering Support Joint Institute for Nuclear Research Warsaw University of Technology





MPD

- 4π spectrometer
- Au+Au collisions at VsNN = 11 GeV
- Length: 8.2 m
- Diameter: 5.4 m
- ±2 units in pseudorapidity (η)

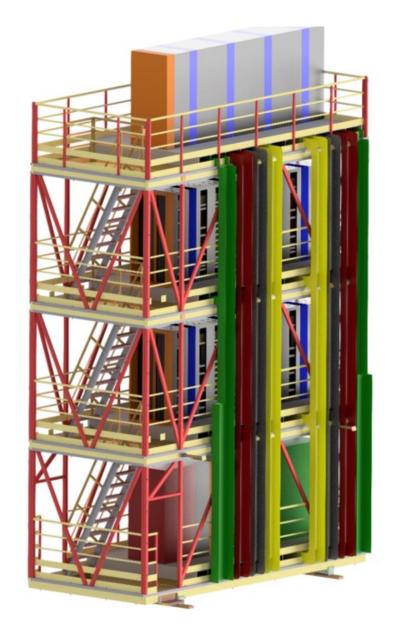


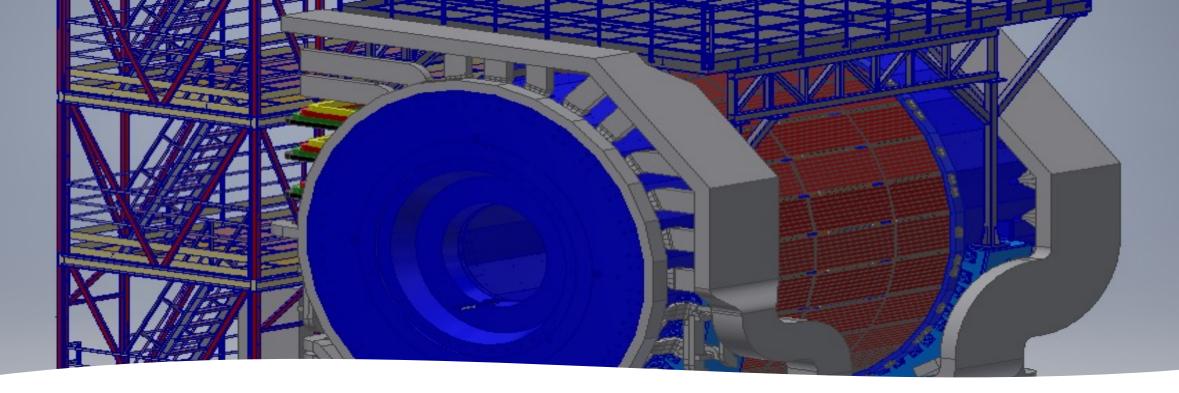


PARTS of the NMP

- Ducting system
- IT RACKS on the NMP
- Raised floor
- Power Supply
- Cooling System
- Structural Cabling
- Access control and management system
- Video based fire detection
- CCTV video surveillance system
- Emergency sound notification system
- Radiation monitoring system
- Magnetic field measurement system
- Autonomous fire extinguishing system
- Intelligent Power Distributor







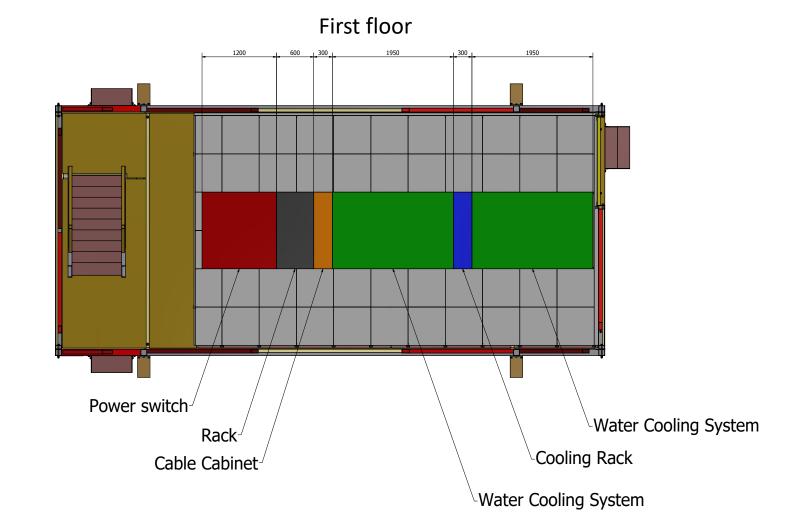
DUCTING SYSTEM

NICA

• Why the NICA-MPD-Platform (NMP) is such important for the whole project?

It is responsible for the collecting all information coming from the MPD detector. On the NMP, connected to the detector, RACKs cabinets will be located. All services (cables, pipes, FO) from the MPD will go inside the cable ducts to the NMP.

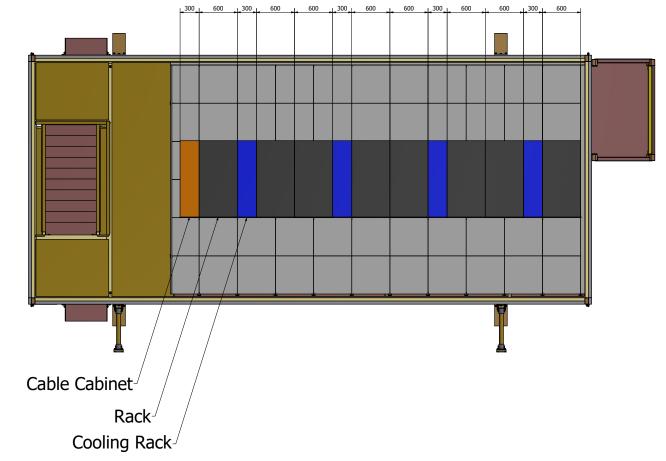
IT RACKS on the NMP





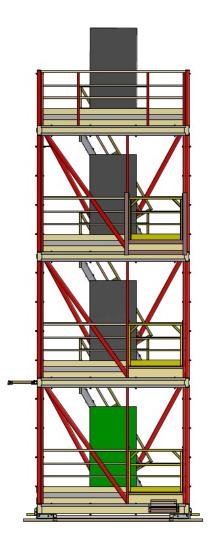
IT RACKS on the NMP

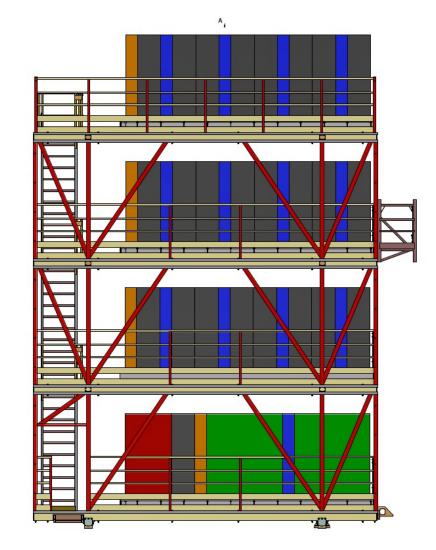
Second, third, fourth floors





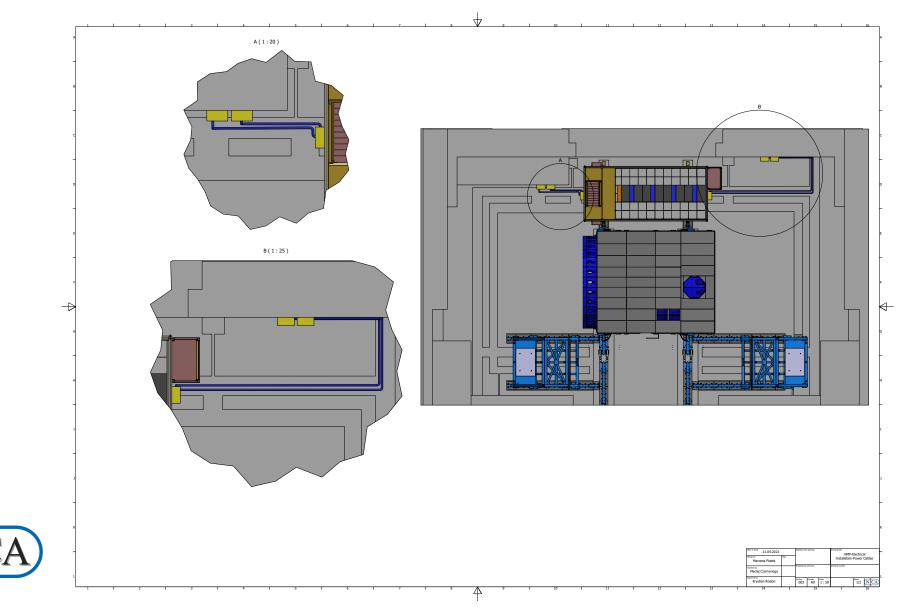
IT RACKS on the NMP



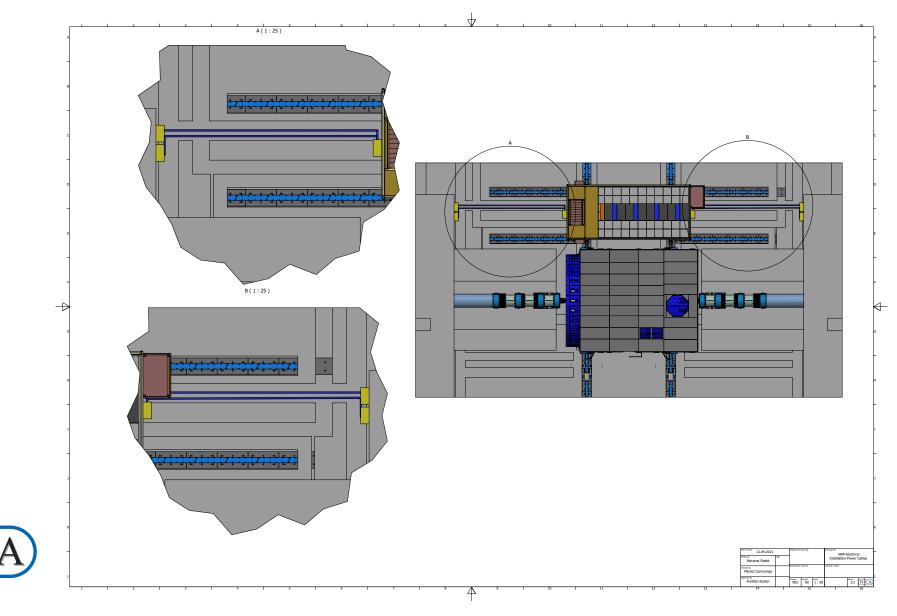




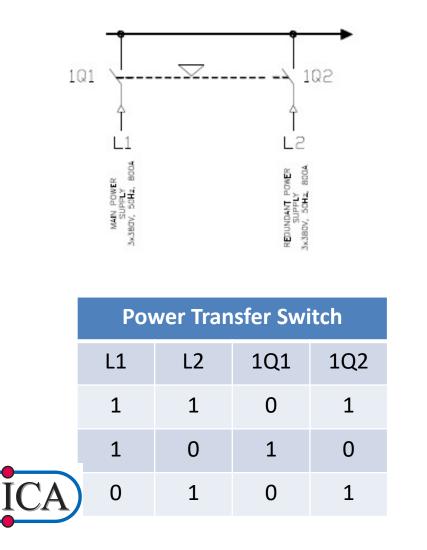
POWER SUPPLY (SERVICE)

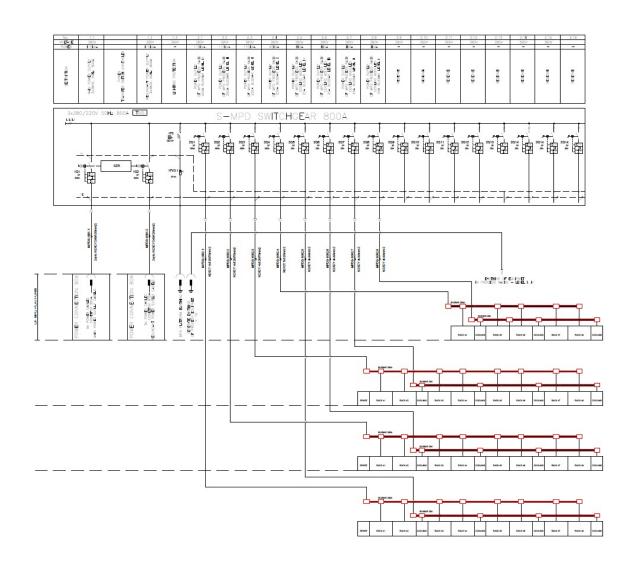


POWER SUPPLY (RUN)



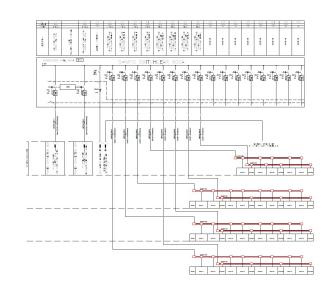
POWER SUPPLY

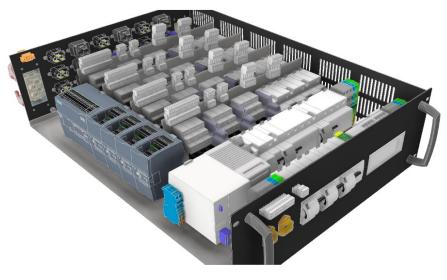




POWER SUPPLY

	Name	Power (kW)
	Inside the MPD detector	
1	TOF	2
2	ECal	16
3	FFD	0,1
4	ITS	10
5	FHCal	1
	In tota	l: 30
	Outside the MPD detector	
	(NICA-MPD-Platform)	
6	ТРС	40
7	TOF	30
8	ECal	30
9	FFD	10
10	FHCal	5
11	MCORD	5,2
12	DAQ	30
13	NICA-MPD-Platform	90
14	Reserve	65
	In tota	l: 305 (335)
	Upper Platform	
15	Cryogenics Platform	65
	In tota	l: 65 (400)

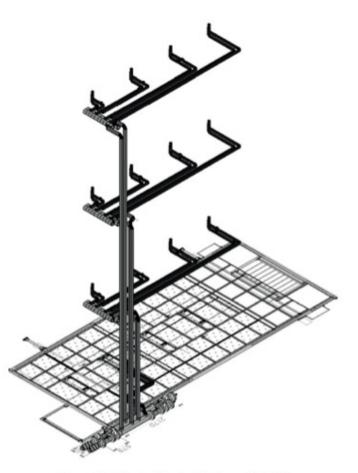


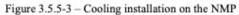


COOLING SYSTEM

- Air return temperature from racks: 37°C
- Return air RH: 35%
- Operating temperature inside racks, air supply temperature 37°C
- Relative humidity not controlled
- Cooling medium chilled water 18/23°C

Leve I	No. Of unit	Unit	Cooling power @ 37C35%_water 18/23C	Flow	Chilled water parameter	Electrical supply	Electrical Power	
			kW	m3/h			kW	
1	K0-3	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
2	K1-1	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
2	K1-2	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
2	K1-3	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
2	K1-4	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
3	K2-1	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
3	K2-2	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
3	K2-3	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
3	K2-4	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
4	K3-1	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
4	K3-2	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
4	K3-3	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
4	K3-4	10RHC0250	25,8	4,45	18/23 water	230/1/50-60	0,81	
	9		335,4	57,85	minimum dD in a	water flow 14EkBa	10,53	
			kW	m3/h	minimum dP in water flow 145kP		kW	





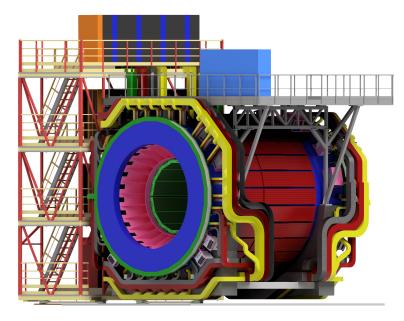


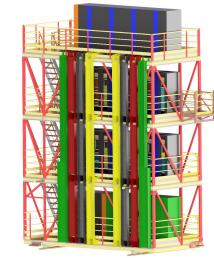
STRUCTURAL CABLING

MAP 58 58 744 FayOur < FIRERU FRSHALCK 3 > FID MAP 58 58 744 FayOur < FIRERU FRSHALCK 3 > FID MAP 58 55 74 FayOur < FIRE FILE FAX MAP 55 55 74 FayOur < FIRE FILE FILE FILE FILE FILE MAP 56 51 8 At 1000 × FIDE FILE FILE FILE FILE FILE MAP 50 51 8 At 1000 × FIDE FILE FILE FILE FILE FILE MAP 50 51 8 At 1000 × FIDE FILE FILE FILE FILE FILE FILE FILE FILE FILE FILE FILE FILE FILE	Unit Unit Unit of MMP 56 58 Ku2 (cpl): < 1955 (188 AUX 3> FEG MMP 56 58 Ku2 (cpl): < 1955 (188 AUX 3> FEG MMP 56 58 Ku2 (cpl): < 1955 (188 AUX 3> FEG		C 40 NHP RT ES R44 EgDe: MRAPHUT000001490 × R5H; RACK > 600+12064TU (197)	FR BT PR, BAS FACH: MRAPHI (1999) AND S BAR BACK > AND (2004/2011)	THE REAL PROPERTY AND PROVIDED AND A DAME AND A	HMP RT ES RAT EQDE: MIAPWUT000001486 4 R5M; RACK > 600x1200x470 (19")	TA BE DAN FORM MANY DESCRIPTION AND A BACK NON
NMP 88 85 H41 Euclis: < HBM, PAMminiPhy > Analyser NMP 85 85 H41 Euclis: < HBM, PP 48 Pwrt > H0 44P 8145 Cu MMP 85 85 R41 Euclis: < RAM: SMT019: > 24P Cut 8.1		MMP 88 E8 R43 EqDix < FIRESI, FRS-RACK 3> FED	M NAP 38 ES K44 Eydle < FREELFREEMACK 3> FED NAP 38 ES K44 Eydle < KASI (RABINARTy > Analyser	MP 38 E3 R45 EqD(x < FIRE3), FR3-RACK 2> FED	MAP 35 ES KALEGÓN < FRESL FREAKSES > FED NAP 35 ES KALEGÓN < FRESL FREAKSES > Analyse	MMP 88 E3 KATENDIK < FIKESI, FK3-KACK 3> FED	W NAP SS ES KALEURA « PRESUPES PARACITA
	MMP 55 ES K42 EgDix < KSK; KSKindPhy > Analyse MMP 55 ES K42 EgDix < KSK; KSKindPhy > Analyse	NMP 55 ES 1143 EqClo: < FBAH; FBAHristiPhy > Analyser NMP 55 ES 1143 EqClo: < FBAH; FP 45 Part > HD 45P BJ 45 Ca	MMP 88 ES R44 EqDix: < RSR; RSR(InsRPhy > Analyser MMP 85 ES R44 EqDix: < RSR; PF 48 Port > H3 48P RJ45 Cu	NMP 83 ES R43 EgDix: < R3M, R3MinistPhy > Analyse NMP 83 ES R45 EgDix: < R3M, PP 43 Pert > H3 48P 8J48 Cu	MAP 55 ES KAI EgDi: < KSR; KSRinialPhy > Analyse MAP 55 ES KAI EgDi: < KSR; KSRinialPhy > Analyse	MAP 55 ES TAT EqDix: < RSR; PGMintelPhy > Analyset MAP 55 ES TAT EqDix: < RSR; PP 43 Pert > H3 48P 8345 Ce	MAP 85 ES KAI Eyőle. < KSR; KSR; KSR; KSR; KSR; KSR; KSR; KSR;
	NUP SS ES RV2 Ecite: + RAIE SWITCH + 24P Cat. 8.1	MMP 55 ES INCIDEDE: < ASIN: SMITCH > 34P Cet. 5.1	NUP SS ES R44 Dobe: + RAN; SWITCH > 24P Cat. 8.1	NMP 55 ES Rel Egile: < RSB; SWITCH > 24P Cal. 5.1	HIRP 55 ES FAG Egite: + BAR, SWITCH > NP Car, B.1	NMP 55 ES RAT bebe: « ASIN: SWITCH » 24P Cat. 8.1	NWP 55 E5 FMI EqCe: + BAN; SWITCH > 24P Ca
MAP 55 ES RATEQUE: * PESERV; ** 1 MAP 55 ES RATEQUE: * RESERV; ** 2	MAP 55 ES RAZ EQUE: 4 RESERV; - 4 1	MMP 55 ES RAS EQUO: 4 PEDERK) - 4 1 MMP 55 ES RAS EQUO: 4 RESERK) - 4 2	NMP 55 ES RA4 EQUE: * REDERX;-* 1 NMP 55 ES RA4 EQUE: * RESERX;-* 2	MAP 55 ES INS LEUD: * HESERY; + 1 MAP 55 ES INS EQD: * RESERY; +> 2	NWP 55 E5 FM6 EQUC: 4 EWP17;-* 1 NWP 55 E5 FM6 EqUC: 4 EWP17;-* 2	NWP 55 E5 KHT EQDE: 4 EWP17;+* 1 NWP 55 E5 KHT EQDE: 4 EWPTY;+* 2	NMP 55 C5 (540 EQU0: 4 EMPTY; - 4 1 NMP 55 C5 (340 EQU0: 4 EMPTY; - 4 2
MP 55 E5 R41 EqD:: < RESERV; -> 1	MP 55 E5 Rd Edby (RESERV> 1	MMP 15 ES RAI EQDX: <reserx;>> 1 MMP 18 DAQ R43 EQDX: <rem. 48-fw1lc="" fpf0=""> MPD-PFF0-48P-LCF4-R43</rem.></reserx;>	HMP 55 ES FM EQ20: < RESERV; -> 3	MAP 55 ES BAS EQDX: < RESERV; -> 3 NIRP US DAD, KRI FEDH: < RSM, PPPO 48 Per LC - MPD PPPO 48 PLC	MAP 15 D12 RM E40: < EMPTY -> 1 MMP 15 D12 RM E40: < EMPTY -> 1 MMP 15 D12 RM E40: < EMM E40: E40: ME0.PHO.MP.LC	NHP 55 ES RATEQUE: < EMPTY:-> 3 NHP 15 EMQ RATEQUE: < EAM PPEOR PAILE > NPE-PPEO-MP-LE	MP US ES ES ES ES EQUX «EMPTY-> 3 MP US EMQ REE EQUX «EMIL PFO EMPUTE> MPD
IN LIS EAG RATE-COL < KEM FRYO & Furt C> MPD-FFO-GRACEFARAT MMP LIS ES 841 EgDit: < 8582, Cooling Steering Wheel > Cable Organizer	MP105 DAG REZ FUCH < RAM, FFEG 65/H11C> MPD/PFEG48/LC/44/81 MP105 DE RC 2006 < 8.5M, Secting Streeting Wheel > Gold Organizer	MM* US ES INCIDED's: < ISSN: Cooling Steering Wheel > Cable Organizar	MP US DAG BAS FUTUL K RAIN FFFO 65-MFD. (C-2-MFD.)/FFO.65-A.(C-2-4.84) MRF US DS TR4 ExtEx - RAIN Cooking Electing Wood > Cook Organizer	MM* US EX. RxI ExDit: < RSM; Cooling Steering Wheel > Cable Organizer	NMP US ES Rel EuCli: < REM, Cooling Streting Wwwel > Cable Organizer	MMP US ES R41 Eq24: < REM, Couling Steering Wheel > Cable Organizar	HMP US ES R48 EqC6: < RAM, Cauling Steering Wheel > C
NMP US DAQ. BAT Ex254: 4 MPL Acute SETON 245 JL071A > MPC-596-50 AMP US FS. BAT Ex254: 4 DARE Confine Structure Mised & Cable Organizer	NWP US DAD, RAI EqCE: < HP; Aribe 3010M 34G A.DFIA > MPO-SW-SC	HMP US DAQ, RKI ExDel: KHP; Ander SEION 340-JUCTA > MPD-SW-SC	NRP US DAD, IN4 EpDe: < RP; Arabe 3819M 34D JUDY IA > MPD-SW-6D	NUP US DAD, RHI EUDE: K HP; Aribe SEION 240 A.OFIA × MPD-SW-80	MMP US DAQ R48 Eq0() < HP; Avios 38108 240 JLETLA > MPD-8W/8C	NMP US DAQ, RAT EXCE: < HP; Avide 3810M 200 JL371A > IMPD-9W-8C	MMP US DAQ_RAS Ex[0]: < HP; Anales Stride 240 JLETTA > MMP US PS, PAS PaCe: < REM_Cardina Streeting Wheel > C
	12	MMP US TPC IIA3 EqSic. < JNR; 2 issues synchronization > Laser Sync Module	MRP 115 FF. Did Endler: a BSMC Contine Standard Wood a Cable Oreanizer	MMP US TPG R44 ExDit: < GAEN: Central for GAEN HV+LV > \$7 5527	ui in the second		
	NHP US TPC R42 EqDe: + CAEN; EASY 3000 with ten + MPD-TPG-LV-Create-2	MR105 ES BALLANK & BBR Control Standard March & Colds Consultar	NMP US ES R44 EqCE: < R&M Cooling Steering Wheel > Cable Organizar	All of its integer, total, can be destined to an	MR2115 E5 PM Enfty: a PMM facility Standay Wand & Cable Develope	NMP US TPO THE EXDS: + CAEN; EASY \$500 + MPD-TPG-LV-GRATE-10	
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	WE IN ST SHIELD A SHE Control Starting Ward & Cold Develop		NRP US TPC R45 EqCb: < CAEN; > Oscilloscope			MID 10 ES EVERITA / BID Code Studio Mad > Cole Orador	*
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NHP US TPC INI EgO: < CAEN; AMIR > MPC-TPC-LW-ACDC-1	MMP US ES IN42 EpCla: + ISSM: Cooling Steering Wheel > Cable Organizar	MMP US ES INCI EqDit: < ISSN: Cooling Steering Wheel > Cable Organizar	Plan us co has course is said; upoing calendy when a calos organizar		NMP US ES IN40 EqC/b: < SAME Cooling Steering Wheel > Cable Organizar	NMP US ES. R4T EqDit: < 8.5.N; Cooling Steering Wheel > Cable Organizar	MIP US THO INS ENDS: 4 CAESE ASHID > MPD-THOLD
AND IN THE REAL PROPERTY AND A STORY RESIDENCE AND A STORY AND A STORY	4 😁	MAP US THE INCIDENT + CADIL AMIS + MID-THE-LY-ACDE-4	NHP US TPC RH EgDs: + lasg: -30 W or -75 KF > TPC HK Membrane	MANUAL PL AND LOD, a 2010 Confee Stories Manual & Cable Consulars	NHP US TFC R45 Eg0: + CAEN; AMM + MPD-TFC-LX-ACDC-8		Mart 10 Per Data Fache - Balls Condex Render March - C
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P US TPC: Rel EqD4: <wsu, (12x1)="PS" 4004dc0a(3pc)="" 6="" mod.=""> Gete System 1</wsu,>			<u>;</u>				HMP US TPC Rel EqDs: < WSU, 12x1, PS 400VDC38 2pc >
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MMP US ES IR41 EpDs: + R&R Cooling Stawing Wheel > Cable Organizer	MIP US THO BAZ ENDS: + CAESE ASHE > MPD-THO-LV-ASDG-3					NHP US TPC THT Eq06: < CAEN; A3484 > MPO-TPC-LX-ACDC-11	NMP US ES IN40 EqCit: < RAM: Cooling Steering Wheel > G
	MAN HE RE DOLLARS A MUN Contra Marcine Marcine Colds Counters	MR 10 FF Brit Felter & B10 Contro Director March & Colds Operators	MAN HA FE BAL FUCK - A RAN Control Render Wheels Code Counters	MADE IN THE BALL PARTY & BITTLE Continue Disorders Mitsurd & Caldia Consultant	Martin P. Bull S. Co. a Mith Control Revolution Mitardia Cable Convolution	MANUAL PR. BUT Rolling and Manual Structure Manual in Calaba Considerat	· ·
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			<u> </u>		*		2
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MMP US ES Rel EqDs: < R&W Coaling Steering Wheel > Cable Organizer	MMP US ES Rel EqCt. < REM; Cooling Steering Wheel > Cable Organizar	MMP US ES RKI EqDs: < REN; Cooling Stewing Wheel > Cable Organizer	MMP US ES Rel EgDs: < REM, Cooling Steering Wheel > Cable Organizar	MMP US ES Ret EqDs: < REAL Cooling Steering Wheel > Cuble Organizer	W MMP US ES R46 EqC6: < R8M; Eacling Steering Wheel > Cable Organizer	MMP US ES IRVI EqDs: < REM; Cooling Steering Wheel > Cable Organizar	NHP US ES R48 Eq06: < RAM, Cooling Steering Wheel > 1
NRP 83 FS Rd Falls < 88M Intelligent Passer Distributor > PD Rd	50 50 SNP 53 FS RG FaClo < FAM Intellined Paper Distributor > IPO RG	WHE TO DO BOT LODGE & ETM. Intelligent Process Provide Access Mit And	CALL STATE OF THE STATE OF THE ADDRESS TANKS TO ADDRESS	NRP 33 FS R41 FuCh: < R3M Intelligent Paper Distributor > IPO R41	C AND ST IT AN E-TH - THE INFINITION PARTY IN THE	NP 53 53 547 Ed.b. < 5340 Indiant Party Distributor > 190 547	MP 88 83 848 Eq21: < P64E Intelligent Power Distribut
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P RT ES R31 EgDs: MRAPWUT000001458 + RAM: RACK + 000x1200x473 (19")	RC 32 NWP RT ES R22 EQE: WRAPWUT000001460 + RAW; RACK + 600e1200e4TU (19')	MMP RT ES R33 EqDs: MRAPWUT00001458 < REM: RACK > 600x1200x478 (197)	C 33 ES 87 ES 834 EqCe: MRAPHU7308001400 + R&R RACK > 608r1238470 (191)	ES RT ES R35 EqDit: MRAPWUT000001456 + RAM; RACK + 600e(300e470 (19')	ES AT RISE Eggle: MRAPHUT000001400 + RAM + RACK 000e1000e470 (197)	NWP RT ES 837 EqDit: MRAPWU7000001456 + RAW; RACK + 600e1200e470 (197)	NUP IT ES RIS EQCE: MRAPHUTISSIONIASO + RANK RACK >
MAP 55 E5 R31 E400: < FIRESE FRO-RACK 3> FED	MMP 55 E5 R32 EqDx: < FRES; FRS-FACK 2 > FED	MAP 55 ES R32 EUDX < FIRESU FRS-RACK 3 > FED	MP 55 E5 K24 Eq24 < FIRES, FRS.FACK 2 > FED	MMP 55 ES R35 EgDx: < FIRSH; FR3-RACK 3> FED MMP 55 ES P15 Europ - 2 P18F P18FAAR5 > Andreas	UKP SS ES KOLEGON: < FREST, FRS-RACK 2> FED	MAP 55 E5 R37 Eq0x: < FIREST, FR3 FACK 3 > FED	UKP SS ES FOR EQDA: < FREISL FRS FRACK 3 1
NRP 53 EX F01 Eq.06: < 8.5.00, PP 45 Part > H0 45P 8.1-45 Ca	U45 MMP 58 65 K12 Ex0x < FAM, FP 48 Fw1 > H3 48P K145 Co	NRP 55 ES R53 Eq.00: < R3M, PP 45 Purt> H3 48P 81.45 Cu	145 MMP 53 E3 K34 E400: < RAM, PP 43 Pu1 > H2 48P K343 Co	AMP 83 85 K35 Eq.00: < KEM, P7 45 Part > H3 45P KL45 Ca	U45 MMP 58 ES K34 EqUix < K64 PF 48 Pert > H3 48 F 5345 Co	AMP 33 ES RIT EQU: < RAM, FP 43 Pw1 > H3 48P 8345 Co	U45 NMP 55 ES 103 Eg/0x < R58 EP 41 Port > 10 40
MMP 88 ES #31 Ex35: < #838; SWITCH > 34P Cal. 8.1	1044 HMP 85 ES 832 EqDit: < RAN: SWITCH > 24P Cal. 8.1	MMP 88 ES A33 ExDix + ASIR SMITCH > 34P Cel. 8.1	NUP 55 ES F.N Egels + RSN; SWITCH > 20* Cal. 8.1	NMP 85 ES 838 Explor < R58: SNITCH > 24P Cel. 8.1	U44 NRP 55 ES FOR EgCh: < R5AE SWITCH > NP Cal. 8.1	NUP SS ES #37 EgDie < #588 SWITCH > 24P Cal. 8.1	NUP SS ES FOR E-CE: < RAM, SWITCH > 24P C
NWP 55 E5 R31 E624: * EWP11;-* 1 NWP 55 E5 R31 E624: * EWPTY:-* 2	U42 NWF 55 E5 R32 E0/61 * EWF11-* 1	NWP 55 E5 RUI DOLE: * DWP11:+* 1	HIS NIP 55 CO 104 EQUE: * EMPTY: - * 1	N#P 55 E5 P35 E0/E: * E#P11:-* 1	045 NWP 55 C5 R36 Eq.(c): * EWP11: * 1	NWP 55 C5 RJ7 EQCE: * EMPTY:-* 2	UN2 NWP 55 E5 R36 Eq.(c) × EMPTY: - + 2
HORP SS ES ROI EQEN: + EMPTY; - + 3	NHP 55 ES R32 EqCe: + EMPTY;-> 3	NHP 55 E5 F33 DoDe: + DHPTY;-> 3	SHE NHP US ES R34 Eq0x: 4 EMPTY; -> 3	NHP US ES R35 EqCe: « EMPTY; -> 3	UAL NAIP 55 ES R36 EqCe: « EMPTY: - > 3	NWP 55 ES R31 EqCe: + EWPTY;-> 3	UNE NAP 55 ES R35 Eq06: « EMPTY; -> 3
NEP US DAD BOT FUDX < RBIE PPF048Pot LC > MP04PP048P4C	UND NUP 55 C5 C2 22 2400 × EMPTy-+ 3 UND NUP 55 242 C2 25 C6 24 AM PPE 0 AVII C > MP2 PPE 0 APACL UND NUP US 51 F02 5404 × 5104 Centra Streng Week > Color Organizer	NUMP US DADE KEST KEST DECEMENT (* 1977) * 3 NUMP US DADE KEST KEST (* KENT DEFENSION (* 1970) AND PRODUKTIK NUMP US RES KEST FUEL * KENT (* KENT (* KENT *	AND DESCRIPTION CONTRACTOR OF CONTRACTOR AND DESCRIPTION OF CONTRACTOR AND DESCRIPTION OF CONTRACTOR AND DESCRIPTION AND DESCRIPTION AND DESCRIPTION	NEP US DAD AD FOR K ABB PROBADY LC > MPD PPO AP (C MP US DAD AD FOR K ABB CALL PRO APPO APPO APPO APPO APPLC	AMP 55 ES ROS EQUE: * EMP 17 - > 3 AMP 55 EQ ROS EQUE: * EMP 17 - > 3 AMP 55 EQ ROS EQUE: * EMP PPO ENFORTEC MAP 15 EX ROS EQUE: * EMP 200 ENFORT Visit > Cable Organizer	NEP US DAD, KUT FOCH - K KAN (Deline Sheri Carlos Prior April 1975) NEP US DAD, KUT FOCH - K KAN (Deline Sheri New York) Prior April 1975 NEP US DAD, KUT FOCH - K KAN (Deline Sheri New York) - Color Organization	KNP 15 CP 155 CP 1
NMP US DAG: 831 EEDI: KHP, Anile SEIGH 245 JULTIA > MPD-SM-SC	USB NAM US SALE F32 ExCel: < KP, Andre 31134 345 A.0114 > MPO-8W-85 USF NAM US ES F32 ExcE: < RSM: Cooling Sheeing Wheel > Gable Organizer	NUM US DAQ 833 ExDe: KHP; Anxie SEISH 240 JLOTIA > MPD-SW-80	XXX NUM US DAD HIM EQDE: < NP; Arabe 3810M 240 A.071A > MPO-EW-80	NRP US DAQ, R25 EqDe: < KP; Anide 2010M 240 JL0TIA > MPO-5W-80	USB NNP US DAQ RIN EXCE: < HP: Avide 3810M 240 JUSTA > MPD-BW-BC	NWP US DAD, KIT BODE: K HP; Andre 3810M 340 X,011A > MPO-8W-80	USB MAP US DAQ R38 Eq05: < HP; Anda 38108 243 JUETA
	MMP US ES F.12 EpDe: + NSR: Cooling Steering Wheel > Cable Organizar	MP US ES 833 EcDit: < RSR; Cooling Steering Wheel > Cable Organizer NRP US ES 833 EcDit: < Caser: News 83481 a ACI Entrol and	27 29		100	MMP US ES 107 EoDit: < 1588; Gooling Steering Wheel > Cable Organizer	uw.
MMP US ToP #31 EgDs: <; > Slow Control & Trigger	038		100		038		038
	054		394 197		054		054
NMP US ES R01 Eq0s: + R&R Cooling Steering Wheel > Cable Organizer	U32 NMP US HEORD R33 EqCe: + SWERK; MTCA + CRATE-1		12		022	NMP US WOORD R31 EqC6: + SWIERK: MTCA + CRATE-3	US2 NMP US ES R30 EqC6: « RLM; Cooling Steering Wheel » (
					00		430
	429	MMP US ES R33 EqD4 < Sensor, Fabri Farel Fiber C.533 > PP Fiber	129		029		u29
NMP US TOF IRST EXDLX: < WIENER; TXMPVSI 161 MPOD LV module > LX-1	USB MMP US EX FX3 ExCE: < RLM, Couling Swering Wheel > Cable Organizer	MMP US F3 H33 Fp34 K RSN, Conting Starting Wheel > Colds Organizar U MMP US F3, H33 Fp34 K Starton, Fabric Facel Facel Facel Facel	45		107	MMP US EE . R37 EuDie: < R5M; Geeling Elsering Week > Cable Organizer	U28 MAP US THE ROLEGOLI - WENER, THAPVO THE MPOD LY
	USS	MMP10515 R33 EgGts: < Stemon: Patch Fanel Fiber (, C-34 > PP Fiber	50 105		028		028
	US5 NMP US MCORD R53 EgOs: < SWERK: Fischer Electronic > SYNCHRONIZATION CRATE-1	MMP US ES \$33 Epide: < R58; Cooling Steering Wheel > Cable Organizer	<u>18</u>		025	NRP US MCORD /RST Eig0s: < SWERK; Flicher Electronic > SYNCHRONIZATION CRATE-3	U25
MMP US ES R01 Ex00: < R&M: Cooline Steering Wheel > Cable Organizer	US NMP US ES F33 EqDit: + R&M Cooling Steering Wheel > Cable Organizar	MAP US ES KUI EQUE * Serror: Patch Panel Floer-LC-34 * PP Floer	104 105		NWP US ROI CODE: + Cinco: Nexus \$2180 + AGI Fabric Last	MP US ES R37 Ec04 < RSM Casting Steering Wheel > Cuble Organizer	U22 NHP US ES R30 EaCh: + RAM: Cooling Steering Wheel + 1
	1022	MMP US ES #33 EqDs: < R&R Cooling Steering Wheel > Cubie Organizer	NOP US ES FOR Each: > Firs extendes writers	MP US ES R35 Each: < Exect: > Fin protection extern	U22 NMP US ES R36 EqCe: < R&M Exoling Steering Wheel > Cable Organizar		u22
	100	MAP US ES KID SQL - Carence Fabri Fabri Fabri CC-31 > PP Fabri MAP US ES KID SQL - Carence Fabri Fabri Fabri CC-31 > PP Fabri	17 17		MRP US KIR EQDL: < Calco, Nexus Epildo > ACI Nore Law MRP US RIM ExClo: < Seven Salutions, MRI 378 > Tining Selash		020
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NMP US ES R01 ExDo: < RAIK: Cooline Steering Wheel > Cable Organizer	08 05	MMP US ES R33 Egite: + Semon: Pation Panel Fiber-LC-34 + PP Fiber MMP US ES R33 Egite: + Semon: Pation Panel Fiber-LC-34 + PP Fiber	15		WHP 35 0 4 0 500 0 0 to - Service, Patch Funct Tore 1.2-6 + IP Fiber U15 INHP 35 0 4 0 500 0 0 to - Service, Patch Funct Tore 1.2-6 + IP Fiber U14 INHP 35 0 4 0 500 0 0 to - Service, Patch Funct Tore 1.2-6 + PP Fiber		U15 U14 NRP U5 ED R31 EpCt: + R8M: Cooling Streeting Wheel + C
MMP US ES #31 EqDs: + R&R Cooling Steering Wheel > Cable Organizer	UIS UIS UIS UIS MAP US ES R23 EqCt. « Raik, Cooling Steering Wheel > Cable Organizar	MMP US ES E33 E024 - 4 Semon Patri Parel Francisci - 20 Fiber MMP US ES E33 E024 - 4 Semon Patri Parel Francisci + 20 Fiber MMP US ES E33 E024 - 4 Mile Colling Sawing West + Cabi Organizar	25 34 25		Net 55 340, EX Code + Serect Telo Tané Tan-L-44 - 19 Tile Net 55 340, EX Code + Serect Telo Tané Tané Tané Telo -L-44 - 19 Tile Net 55 340, EX Code + Serect Telo Tané Tané Tané Telo -L-44 - 19 Tile Net US Co R35 Code + Salt, Coding Stealing Wasi + Code Organizer	MMP US ES RDT Exten < R.S.M. Conting Standing Would > Cable Organizar	UIS UIS UIS UIS UIS UIS UIS UIS UIS UIS
NMP US ES IR31 Eq35: + R&R Cooling Steering Wheel + Cable Organizer	UIS UIS UIS UID MP US ES REI EQTE: « BBAC Cooling Standing Yorkal > Cable Organisar UID UID AND ES REIDED REI Factor « SAMERE Factor Factorial > SYNCHEOREZ. TOR C REIDE	MP US SS F33 Egds + Sensor, Fasto Fasel Fiber-LC34 + PP Fiber MP US SS F31 Egds + Sensor, Fasto Fasel Fasel Fiber-LC34 + PP Fiber MP US SS F33 Egds - C4845, College Sensor (Hater Fiber-LC34 + PP Fiber MP US SS F31 Egds + Sensor, Fasto Fiber Fiber-LC34 + PP Fiber MP US SS F31 Egds + Sensor, Fasto Fiber Fiber-LC34 + PP Fiber	26 26 26 27 27 27 27 27		UID WE 25 56 25 26 26 + 5 most hint han the Cale of the UID WE 25 56 25 26 26 + 5 most hint han the Cale of the UID WE 25 5 RM 525 + 5 MK Cooling Sweng New * Cale Organizar UID UID UID UID UID UID UID UID UID UID	MP US ST 527 FLBs: < 850 Coning Stanlag Ward > Cold Organiae NW US NOOD RT FLBs: < SWERK Flager Flagtonics > SYSCH0027200 CE27-6	Vice Vice Vice Vice Vice Vice Vice Vice
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NRP US THE RUTH BYTELL AND BEEN AND A MANY MANNER HIV MANNER HIVS	UII XMF IS ACCOR XX2 (Spin C 1000547; Faure E lancesis) = VYCC4002421005 (SAV); 2 VM VM IS XX1 (SAV); 2	Wind Carlos Carlos A - Sector March Program (Inc. 24) and 21 (Inc. 24) and	n Mer 213 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 213 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo Synam Mer 113 2015 (c. 138), Colog Santa Mart 1 Colo	Mar (11) 15 (2) - 1143 (song tang tang tang tang tang tang tang ta	90 197 197 198 199 199 199 MAR US CS FOLLEQUE: + 8.8.M, Cooling Steering Wavel + Cable Organiser 199	MPU3ES 837565 - 4334, Contra Swring Ward > Collo Ogenter MPU39502 917562 - 97022 - 97022 970 961 MPU3ES 101664 - 1334 (Swring Sarrige Mari - Sard Ogenter MPU3E3 8375656 - 4334, Costing Sarrige Ward > Collo Ogenter	013 014 017 018 019 019 019 020 031 0407 US 5:5 (231 Epide: + 824% Cooling Steeling Waves - 04
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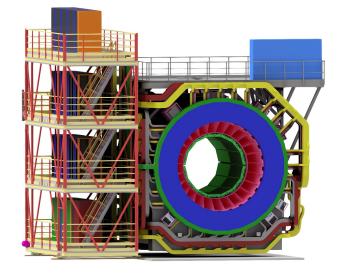


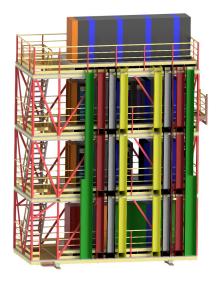
STRUCTURAL CABLING











RADIATION MONITORING

Туре	EKO-C	EGM-104	
Measuring range	10 nSv/h – 1 mSv/h	10 nSv/h – 10 Sv/h	
Number of GM tubes	1	3	
Gamma energy range	50 keV – 1500 keV	40 keV – 3000 keV	
Interfaces	RS-485	RS-485, RS- 232, USB	
Manufacturer	POLON-EKOLAB	NuviaTech Instruments	
Country	Poland	Czech Republic	







RADIATION MONITORING

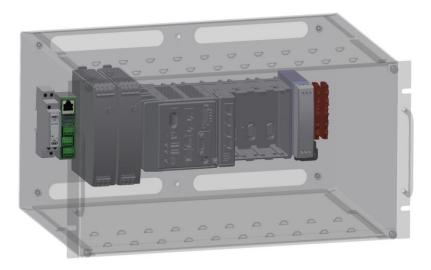


FHT 762 neutron probe





FHT 6020 controller



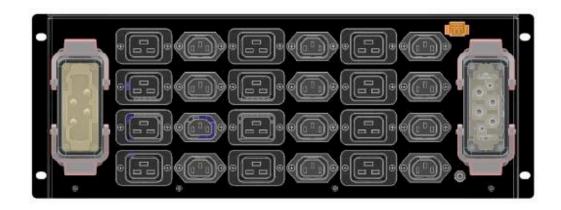
Full system controll box with cRIO and power supplies



Intelligent Power Distributor

- Allows to connect up to 24 electric devices to a threephase network
- Allows to switch connected phase on each outlet
- Balances the load on each phase
- Monitors the electrical network
- True RMS measurement, up to 63'th harmonic
- Detects and separates noisy electric devices
- Has short circuit protection
- Remotely monitors the states of the circuit breakers and remotely resets them







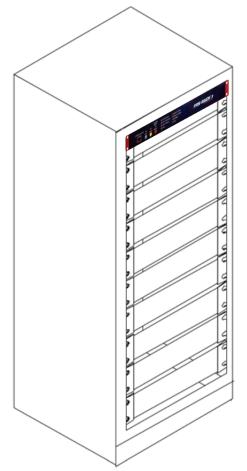
Intelligent Power Distributor

- Has prepared SCADA in TIA Portal v16
- Soft start for all connected devices
- Configurable, sequential startup and shutdown for all connected devices
- Can be integrated with Fire Alarm System
- Will be installed in each RACK
- Is modular and scalable
- Default module occupies 4U





Fire extinguishing system description:



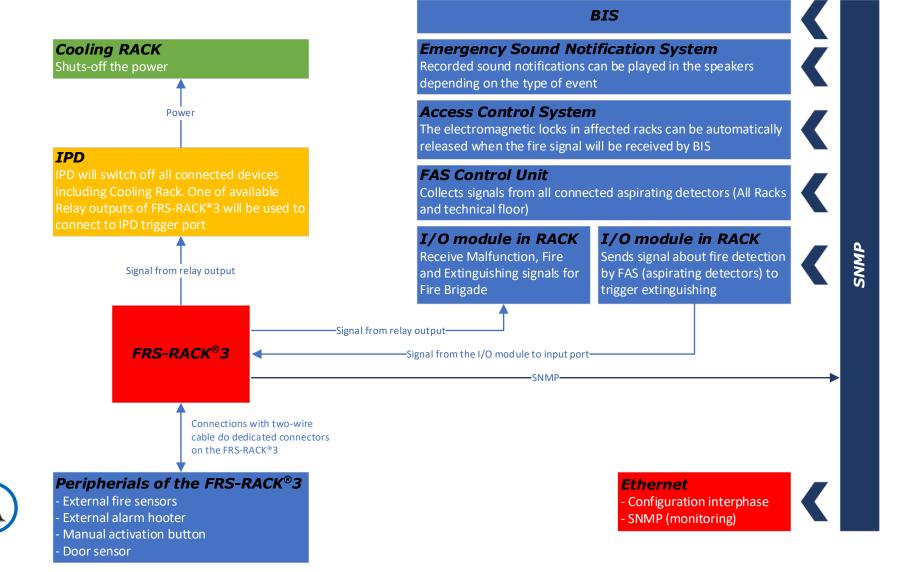
FRS-RACK[®]3 is an autonomous, fully automatic fire detection and extinguishing system. The device is designed for a fire protection of 19" rack enclosures.

Height:	1U		
Sensors:	2x internal + 4x external (configurable algorithms)		
Inputs:	3x external input sources (aspirating smoke detectors),		
	2x temperature sensors, manual activation button, door sensor		
Outputs:	4x output relays, alarm hooter		
Extinguishing agent:	NOVEC [™] 1230		
Communication:	SNMP and Ethernet protocols		

The extinguishing agent is non-corrosive, non-conductive and can be used to extinguish working, sensitive electric equipment with a nominal voltage up to 1,000 V.

Located in the topmost slot of the RACK cabinet, the system monitors the hazard zone. Upon detection of a fire or manual activation, the device will release the extinguishant into the hazard zone through the nozzle. 12V DC backup battery provides energy required in case of no power during extinguishing.

Integration the FRS-RACK[®]3:

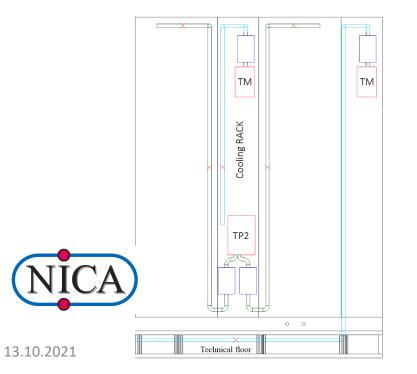


Fire Alarm System:

Aspirating system operates in class A according to EN-54-20.

- Detects fire in the very beginning (in the "pyrolysis" phase), before the visible smoke is released
- Uses intelligent signal processing that minimizes the chance of false alarms
- The detector itself allows for flexible installation outside of inconvenient places (technical floor, cable canals)





Aspirating system will be used to protect all necessary areas:

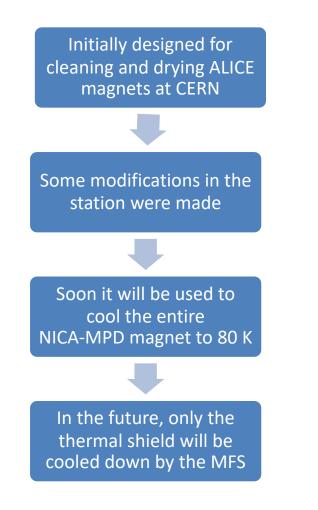
- Cooling Racks,
- 19" Racks with forced air circulation
- Space under technical floor
- Inner side of MPD
- Cable canals

21

Automation for the MFS



MFS (Magnet Flushing Station)

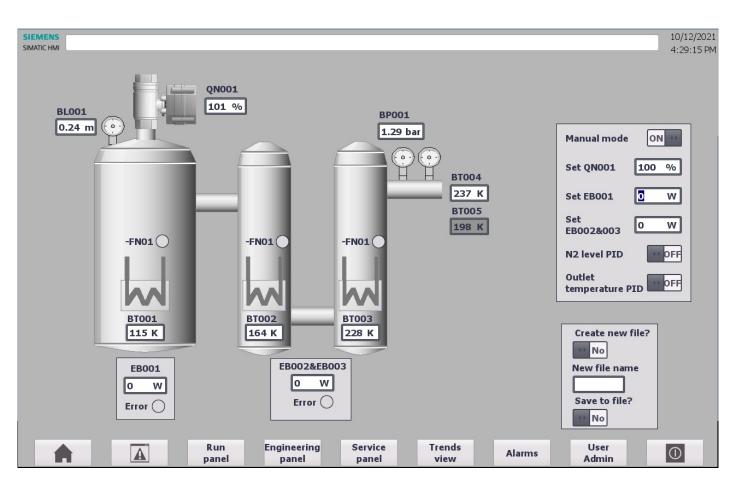




Automation for the MFS

Tasks of the automation system of the MFS:

- Maintaining a constant level of LN₂ inside the MFS
- Regulation of GN₂ temperature at the outlet from the system
- Monitoring the parameters inside the MFS



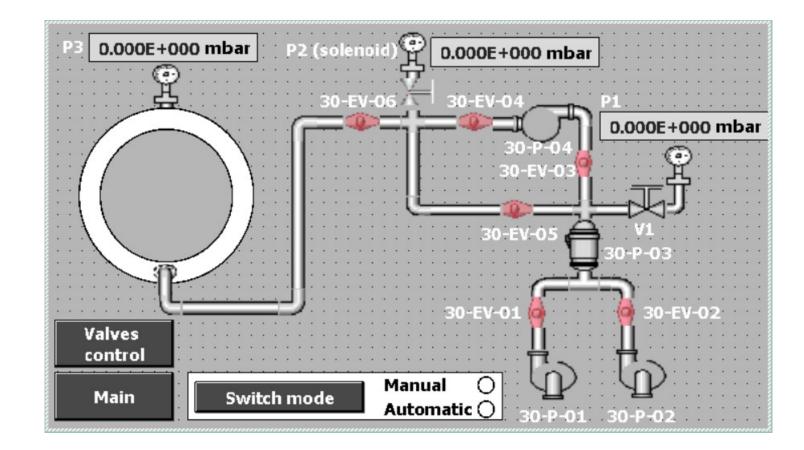


Automation for the vacuum test

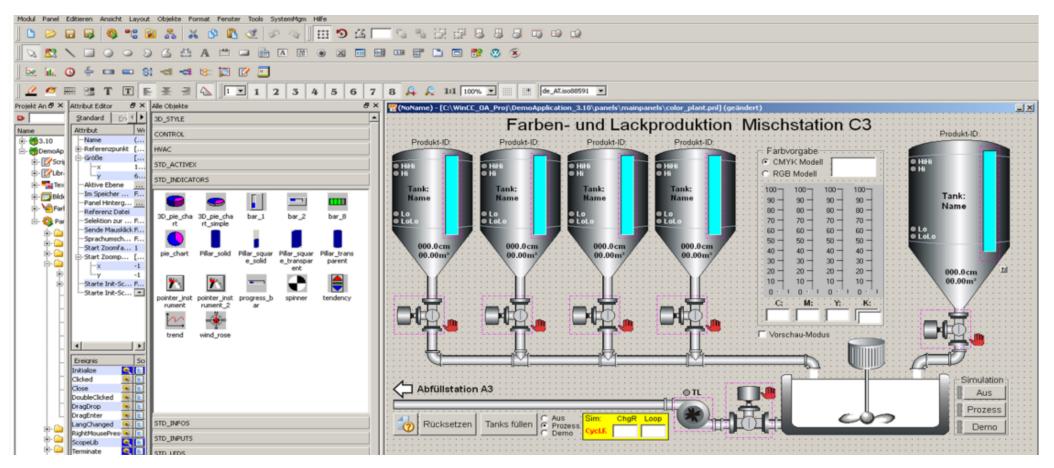
A temporary automation system has been prepared that allows to carry out a vacuum test for the NICA-MPD magnet.

Tasks of the automation system of the vacuum test:

- Valve control
- Vacuum level monitoring at various points in the system
- Magnet protection against pump malfunction







Source: https://new.siemens.com/global/en/products/automation/industry-software/automation-software/scada/simatic-wincc-oa/wincc-oa-basic-software.html

WinCC OA

On October 11, 2021, the Engineering Support sector received a confirmation that soon will be the owner of a license for WinCC OA - software used e.g. by CERN to create SCADA systems. It is planned to use this software in the MPD experiment.

The previously prepared software will have to be rewritten to the new environment.



NAME	STATUS	COMMENTS
Ducting system,		Should be defined till the end of Year
IT RACKS on the NMP,		Designed
Raised floor,		Designed
Power Supply,		Designed
Cooling System,		Designed
Structural Cabling,		Designed
Access control and management system,		Designed
Video based fire detection,		Designed
CCTV video surveillance system,		Designed
Emergency sound notification system,		Designed
Radiation monitoring system,		In Dubna
Magnetic field measurement system,		In Dubna
Autonomous fire extinguishing system,		In Dubna
Intelligent Power Distributor,		In Dubna





13.10.2021

Thank You for Your Attention

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