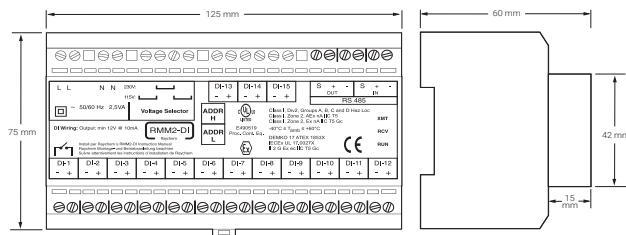# nVent RAYCHEM

RMM2-DI

Trace-Heating Remote Monitoring Module For Digital Inputs

DESCRIPTION

The Remote Monitoring Module for Digital Inputs (nVent RAYCHEM RMM2-DI) provides the capability for the nVent RAYCHEM NGC controller family to read the status of devices remotely, like circuit breakers, and can link them back to the electrical heat-tracing circuits.

The RMM2-DI has in total 15 digital inputs. Multiple RMM2-DI units can communicate via a single RS485 cable with a single User Interface, providing centralized monitoring capabilities. Depending upon the control system selected the number of RMM2-DI units per system can differ. For technical assistance, call your local nVent representative or the nVent service center.

APPROVALS

CE

RMM2-DI module

UL LISTED
c us

E490519
Proc. Cont Eq

Class I, Div2, Groups A, B, C and D Haz Loc

Class I, Zone 2, AEx nA IIC T5

Class I, Zone 2, Ex nA IIC T5 Gc

DEMKO 17 ATEX 1853X   IECEx UL 17.0027X   II 3 G Ex ec IIC T5 Gc

CONDITIONS OF SAFE USE

The equipment shall only be used in an area of at least pollution degree 2, as defined in EN/IEC 60664-1.

RMM2-DI UNIT

Specifications

Part number	1244-018083
EAN	5414506018479
Supply voltage (nominal)	115/230 VAC, ±10%, jumper selectable, 50/60 Hz
Power consumption	2,5 VA
Ambient operating range:	−40°C to +60°C
Relative humidity:	5 to 95%, noncondensing
Digital Input:	2-wire, 12V, 10 mA minimal output
Digital Input wire connections:	2 x 1.5 mm2 cable
RS-485 connections:	Shielded, single twisted pair, max. 1,200 m (~3,900 feet)
Replaceable fuse:	F 200 mA/250 V, Wickmann part number 19370-034-K (FAST BLOW)

⚠ **WARNING:** XPLOSION HAZARD. DO NOT REMOVE OR REPLACE FUSE WHEN ENERGIZED
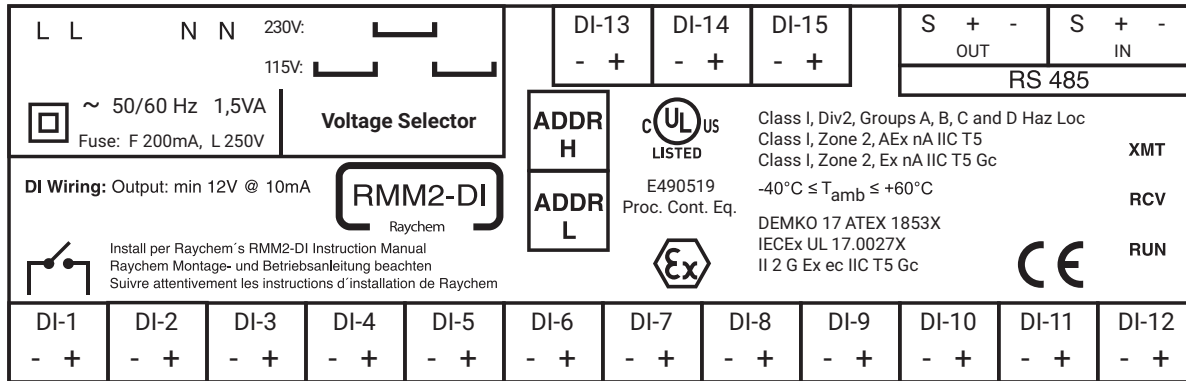
TOOLS REQUIRED

- 7 mm flat-blade screwdriver
- 3 mm flat-blade screwdriver for conductor screws: Torque: min 0.5 NM, max 0.6 NM
- Wire stripper / cutter
- 27 mm spanner (for M20 glands)

PARTS (SUPPLIED)

- RMM2-DI
- RMM2-DI Trace-heating Remote Monitoring Module for Digital Inputs
- Replacement fuses
- Jumper for voltage selection

RMM2-DI LAYOUT

L L	N N	230V:	DI-13	DI-14	DI-15	S + -	S + -
		115V:	- +	- +	- +	OUT	IN
~ 50/60 Hz 1,5VA						RS 485	

□ ~ 50/60 Hz 1,5VA
Fuse: F 200mA, L 250V
Voltage Selector

ADDR H
ADDR L

RMM2-DI
Raychem

DI Wiring: Output: min 12V @ 10mA

Install per Raychem´s RMM2-DI Instruction Manual
Raychem Montage- und Betriebsanleitung beachten
Suivre attentivement les instructions d´installation de Raychem

UL LISTED
E490519
Proc. Cont. Eq.

⟨Ex⟩

Class I, Div2, Groups A, B, C and D Haz Loc
Class I, Zone 2, AEx nA IIC T5
Class I, Zone 2, Ex nA IIC T5 Gc
-40°C ≤ T$_{amb}$ ≤ +60°C
DEMKO 17 ATEX 1853X
IECEx UL 17.0027X
II 2 G Ex ec IIC T5 Gc

CE

XMT
RCV
RUN

DI-1	DI-2	DI-3	DI-4	DI-5	DI-6	DI-7	DI-8	DI-9	DI-10	DI-11	DI-12
- +	- +	- +	- +	- +	- +	- +	- +	- +	- +	- +	- +

⚠ **WARNING:**

This component is an electrical device. It must be installed correctly to ensure proper operation and to prevent frozen pipes, shock or fire. Read and carefully follow all the installation instructions.

INSTALLATION AND CONFIGURATION PROCEDURE RMM2-DI

The equipment shall be installed in an enclosure that provides a minimum ingress protection of IP54 in accordance with EN/IEC 60079-7.

MODBUS ADDRESS

The Modbus address is set via 2 hexadecimal rotary switches. ADDR H is setting the high address number; ADDR L is for the low address number. See appendix A for conversion between hexadecimal and decimal address range.

INSTALLATION OF POWER SUPPLY AND EARTH WIRING

• Select the voltage operating range. Connect the supplied wire jumpers to the appropriate terminals to select input voltage. The RMM2-DI is supplied jumpered for 230 volts.
• Connect wiring from power source to designated terminals on RMM2-DI. Use only copper conductors. Connect power cable wires to the terminals marked L and N on the RMM2-DI. If power is being daisy chained, be sure to maintain polarity of L and N wiring for incoming and outgoing wires. The terminals accept stranded wires from 0.2 – 2,5 mm2. (0,2 - 4 mm2 solid wire).

INSTALLATION DIGITAL INPUT WIRING

Connect Digital Input cables to the RMM2-DI

Remark: The RMM2-DI has two terminals per Digital input. The Minimum power per DI connection supplied by RMM2-DI module is 12V 10mA (Sink/source). The resistance of the sum of the closed contact plus the resistance of the wire to and from the contact may not exceed 10 Ohm.

RECORD THE LOCATION/IDENTIFICATION FOR EACH DIGITAL INPUT

RMM2-DI terminal number	Device identification on drawing #	Device Tag description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

RS-485 MODBUS ADDRESS AND WIRING

SELECT RS-485 ADDRESS AND CONNECT THE RS-485 BUS CABLES

• Each RMM2-DI connected to a RAYCHEM NGC-control and monitoring system must have a unique address; if two RMM2-DIs are assigned the same address, communication faults will result. To ensure that an unique address to each RMM2-DI unit has been assigned, apply the following

  – Review the RAYCHEM NGC system layout; if a layout document does not exist, create one. If it has not already been done, assign an RS-485 address to each RMM2-DI (up to 255)

  – If you are adding one or more RMM2-DI units to an existing RAYCHEM NGC network, confirm that the RS-485 addresses for existing RMM2-DI units correspond to the system layout. See for details the programming guide of the RAYCHEM NGC system. By checking the RS-485 addresses on an existing system, you can avoid potential conflicts that would be confusing and time consuming to troubleshoot otherwise. Record the RS-485 address selected for the Remote Monitoring Module you are currently installing, and label the exterior of the enclosure with the address assigned to the RMM2-DI. See for address range and hexadecimal address switch appendix A.

- Do not make connections to the RS-485 bus while it is connected to an operating RAYCHEM NGC network. Damage and/or alarms could result. The RS-485 bus allows units with unique addresses to be connected together along a common bus. To add a new unit to the network, simply connect the RS-485 bus from the last unit to the new one, or insert the new unit between two existing units on the bus. The order in which units are attached to the RS-485 bus does not matter. There are just two constraints on the RS-485 network

  – Each RMM2-DI must be assigned a unique address

  – The RS-485 bus must be a continuous string from the first network device to the last RMM2-DI in the system.
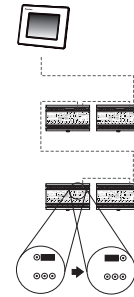
  NOTE

  The RS-485 bus operates at 5 V, and equipment connected to it could be damaged by exposure to higher voltages. Take precautions to avoid exposing the RS-485 wiring to discharge of static electricity or other sources of high voltage potential; in particular, avoid contact with the power supply wiring.

The RMM2-DI has two sets of terminals for connections to the RS-485 bus. One terminal block allows the RMM2-DI to connect to the RS-485 bus, the second allows a continuation of the bus to other RMM2-DI units on the network. Obs
erve polarity, which is indicated on the RMM2-DI. Connect the incoming RS-485 bus to the set of terminals marked "IN", observing the polarity noted on the cover of the RMM2-DI; use the terminal marked "S" for the shielof the RS-485 cab
le. Connect the continuation of the RS-485 bus to the set of terminals marked "OUT" in the same manner (not required for the last RMM2-DI in the network).

IMPORTANT: Do not connect the shield of the RS-485 cables to the general provided grounding terminal. Connect the shield only to the RMM2-DI terminals provided. To avoid the potential for spurious ground loops, the RS-485 cable shield should be connected to ground only in the RAYCHEM unit. For the last RMM2-DI in the network, terminate the RS-485 bus by removing the shorting block on jumper location from 2−3 and placing it across pins 1−2 (See drawing).

Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)
1	0,1	36	2,4	71	4,7	106	6,A	141	8,D
2	0,2	37	2,5	72	4,8	107	6,B	142	8,E
3	0,3	38	2,6	73	4,9	108	6,C	143	8,F
4	0,4	39	2,7	74	4,A	109	6,D	144	9,0
5	0,5	40	2,8	75	4,B	110	6,E	145	9,1
6	0,6	41	2,9	76	4,C	111	6,F	146	9,2
7	0,7	42	2,A	77	4,D	112	7,0	147	9,3
8	0,8	43	2,B	78	4,E	113	7,1	148	9,4
9	0,9	44	2,C	79	4,F	114	7,2	149	9,5
10	0,A	45	2,D	80	5,0	115	7,3	150	9,6
11	0,B	46	2,E	81	5,1	116	7,4	151	9,7
12	0,C	47	2,F	82	5,2	117	7,5	152	9,8
13	0,D	48	3,0	83	5,3	118	7,6	153	9,9
14	0,E	49	3,1	84	5,4	119	7,7	154	9,A
15	0,F	50	3,2	85	5,5	120	7,8	155	9,B
16	1,0	51	3,3	86	5,6	121	7,9	156	9,C
17	1,1	52	3,4	87	5,7	122	7,A	157	9,D

Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)	Decimal	Hex (High, Low)
18	1,2	53	3,5	88	5,8	123	7,B	158	9,E
19	1,3	54	3,6	89	5,9	124	7,C	159	9,F
20	1,4	55	3,7	90	5,A	125	7,D	160	A,0
21	1,5	56	3,8	91	5,B	126	7,E	161	A,1
22	1,6	57	3,9	92	5,C	127	7,F	162	A,2
23	1,7	58	3,A	93	5,D	128	8,0	163	A,3
24	1,8	59	3,B	94	5,E	129	8,1	164	A,4
25	1,9	60	3,C	95	5,F	130	8,2	165	A,5
26	1,A	61	3,D	96	6,0	131	8,3	166	A,6
27	1,B	62	3,E	97	6,1	132	8,4	167	A,7
28	1,C	63	3,F	98	6,2	133	8,5	168	A,8
29	1,D	64	4,0	99	6,3	134	8,6	169	A,9
30	1,E	65	4,1	100	6,4	135	8,7	170	A,A
31	1,F	66	4,2	101	6,5	136	8,8	171	A,B
32	2,0	67	4,3	102	6,6	137	8,9	172	A,C
33	2,1	68	4,4	103	6,7	138	8,A	173	A,D
34	2,2	69	4,5	104	6,8	139	8,B	174	A,E
35	2,3	70	4,6	105	6,9	140	8,C	175	A,F
176	B,0	192	C,0	208	D,0	224	E,0	240	F,0
177	B,1	193	C,1	209	D,1	225	E,1	241	F,1
178	B,2	194	C,2	210	D,2	226	E,2	242	F,2
179	B,3	195	C,3	211	D,3	227	E,3	243	F,3
180	B,4	196	C,4	212	D,4	228	E,4	244	F,4
181	B,5	197	C,5	213	D,5	229	E,5	245	F,5
182	B,6	198	C,6	214	D,6	230	E,6	246	F,6
183	B,7	199	C,7	215	D,7	231	E,7	247	F,7
184	B,8	200	C,8	216	D,8	232	E,8	248	F,8
185	B,9	201	C,9	217	D,9	233	E,9	249	F,9
186	B,A	202	C,A	218	D,A	234	E,A	250	F,A
187	B,B	203	C,B	219	D,B	235	E,B	251	F,B
188	B,C	204	C,C	220	D,C	236	E,C	252	F,C
189	B,D	205	C,D	221	D,D	237	E,D	253	F,D
190	B,E	206	C,E	222	D,E	238	E,E	254	F,E
191	B,F	207	C,F	223	D,F	239	E,F	255	F,F
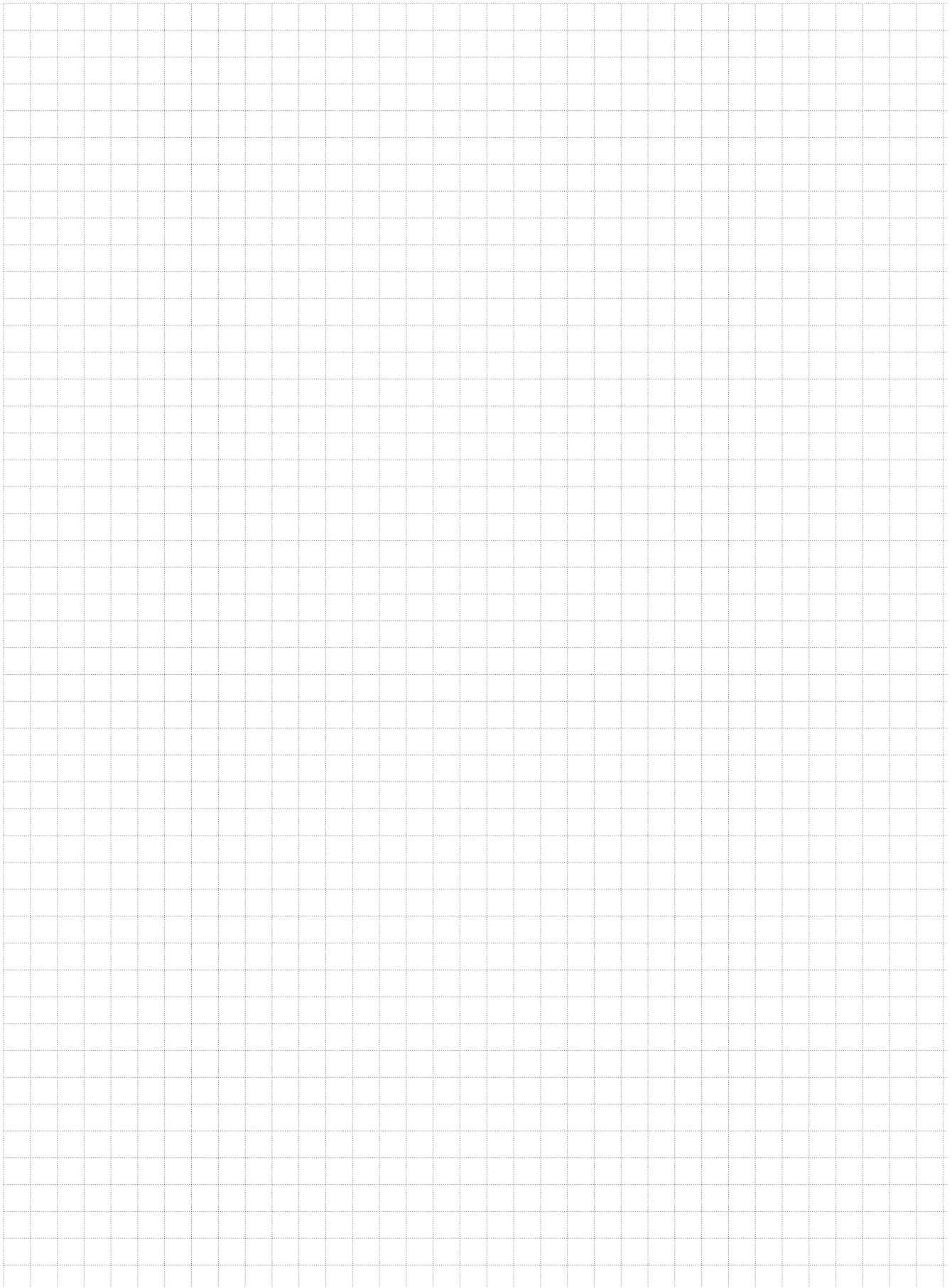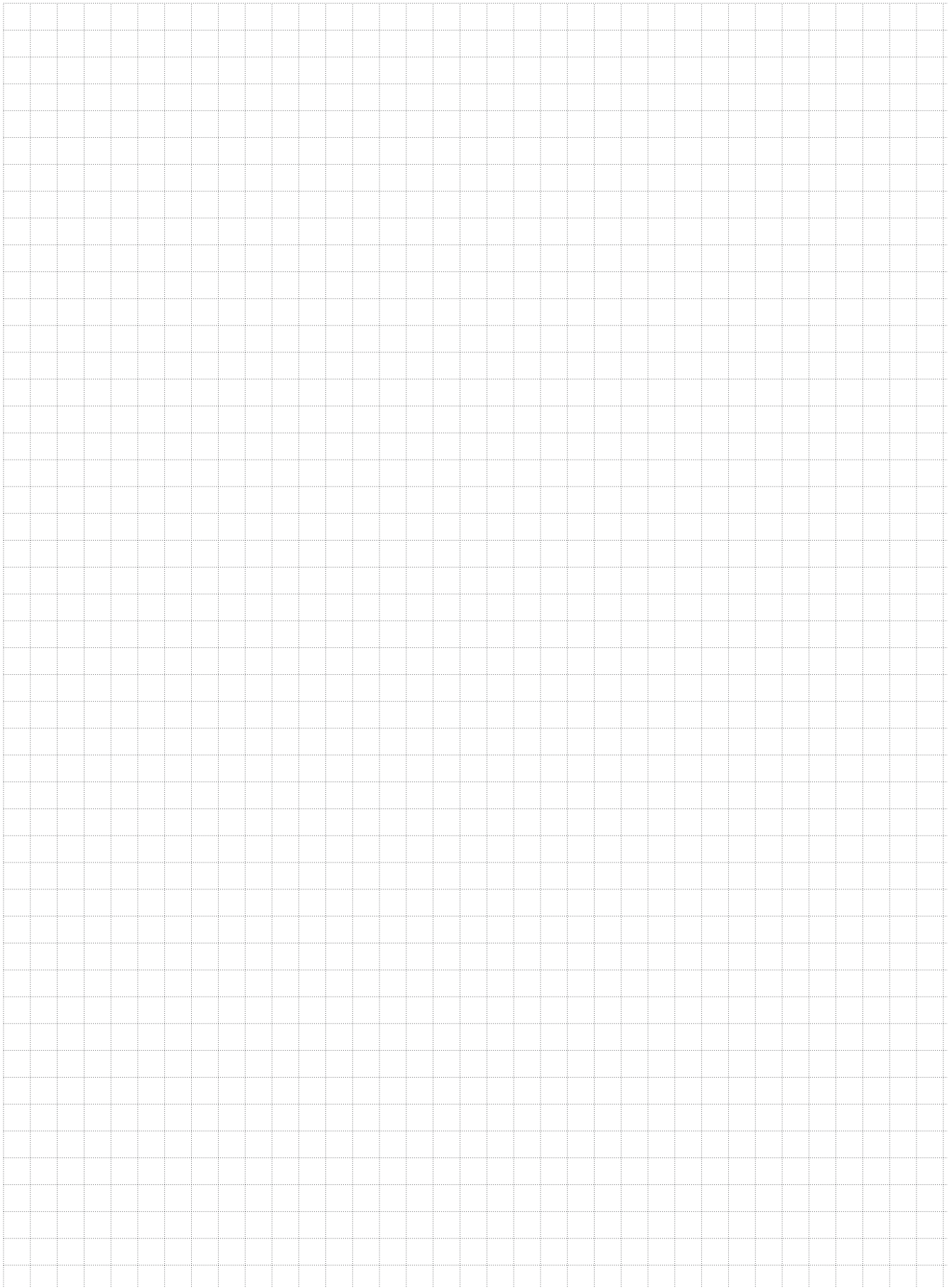
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